NVLAP LAB CODE 600341-0

FCC SAR TEST REPORT

Applicant: **FAMOCO SAS**

Address: **59 avenue Victor Hugo, 75116 Paris, France**

Product Name: **NFC Android Reader**

FCC ID: **2AGQIFX325-VAS**

Standard(s): **47 CFR Part 2(2.1093)**

Report Number: **2402T35202E-20A**

Report Date: **2024/08/07**

The above device has been tested and found compliant with the requirement of the relative standards by Bay Area Compliance Laboratories Corp. (Dongguan).

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SAR TEST RESULTS SUMMARY

Mode		Max. Reported SAR Level(s) (W/kg)	Limit (W/kg)
PCS 1900	1g Head SAR	0.10	**1. 6**
	1g Body SAR	0.66	
WCDMA Band 4	1g Head SAR	**0.32**	
	1g Body SAR	0.71	
LTE Band 2	1g Head SAR	0.26	
	1g Body SAR	0.96	
LTE Band 4	1g Head SAR	0.30	
	1g Body SAR	**1.05**	
LTE Band 7	1g Head SAR	0.09	
	1g Body SAR	1.04	
LTE Band 12	1g Head SAR	0.27	
	1g Body SAR	0.42	
LTE Band 13	1g Head SAR	0.20	
	1g Body SAR	0.50	
LTE Band 41&38	1g Head SAR	0.15	
	1g Body SAR	0.80	
Wi-Fi 2.4G	1g Head SAR	0.23	
	1g Body SAR	0.14	
Wi-Fi 5.2G	1g Head SAR	0.41	
	1g Body SAR	0.24	
Wi-Fi 5.8G	1g Head SAR	0.58	
	1g Body SAR	0.48	
Simultaneous	1g Head SAR	0.90	
	1g Body SAR	**1.53**	
	1g Body SAR	**1.53** (Hotspot)	
Body SAR Test Distance	**10mm**		
Applicable Standards	**FCC 47 CFR part 2.1093** Radiofrequency radiation exposure evaluation: portable devices		
	IEEE1528:2013 IEEE Recommended Practice for Determining the Peak Spatial-Average Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques		
	IEC 62209-2:2010+AMD1:2019 ED1 Amendment 1 - Human exposure to radio frequency fields from hand-held and body-mounted wireless communication devices - Human models, instrumentation, and procedures - Part 2: Procedure to determine the specific absorption rate (SAR) for wireless communication devices used in close proximity to the human body (frequency range of 30 MHz to 6 GHz)		
	KDB procedures KDB 447498 D01 General RF Exposure Guidance v06 KDB 648474 D04 Handset SAR v01r03 KDB 865664 D01 SAR Measurement 100 MHz to 6 GHz v01r04 KDB 865664 D02 RF Exposure Reporting v01r02 KDB 941225 D01 3G SAR Procedures v03r01 KDB 941225 D05 SAR for LTE Devices v02r05 KDB 941225 D06 Hotspot Mode v02r01 KDB 248227 D01 802.11 Wi-Fi SAR v02r02		

Note: This wireless device has been shown to be capable of compliance for localized specific absorption rate (SAR) for General Population/Uncontrolled Exposure limits specified in **FCC 47 CFR part 2.1093** and has been tested in accordance with the measurement procedures specified in IEEE 1528-2013 and RF exposure KDB procedures.
The results and statements contained in this report pertain only to the device(s) evaluated.

CONTENTS

DOCUMENT REVISION HISTORY

Revision Number	Report Number	Description of Revision	Date of Revision
1.0	2402T35202E-20A	Original Report	2024/08/07

1. GENERAL INFORMATION

1.1 Product Description for Equipment under Test (EUT)

EUT Name:	NFC Android Reader
EUT Model:	FX325-VAS
Device Type:	Portable
Exposure Category:	Population / Uncontrolled
Antenna Type(s):	Internal Antenna
Body-Worn Accessories:	None
Proximity Sensor:	None
Carrier Aggregation:	None
Operation Modes:	GSM Voice, GPRS/EDGE Data, WCDMA(R99 (Voice+Data), HSUPA/HSDPA/DC-HSDPA/HSPA+), FDD-LTE, TDD-LTE,WLAN, Bluetooth and NFC
Operation Frequency:	PCS 1900: 1850-1910 MHz(TX); 1930-1990 MHz(RX) WCDMA Band 4: 1710-1755MHz(TX) ; 2110-2155 MHz(RX) LTE Band 2: 1850-1910 MHz(TX); 1930-1990 MHz(RX) LTE Band 4: 1710-1755MHz(TX) ; 2110-2155 MHz(RX) LTE Band 7: 2500-2570 MHz(TX); 2620-2690 MHz(RX) LTE Band 12: 699-716 MHz(TX); 729-746 MHz(RX) LTE Band 13:777-787 MHz(TX); 746-756 MHz(RX) LTE Band 38: 2570-2620 MHz(TX/RX) LTE Band 41: 2496-2690 MHz(TX/RX) WLAN 2.4G: 2412-2472 MHz/2422MHz-2462 MHz(TX/RX) WLAN 5.2G: 5150 -5250 MHz(TX/RX) WLAN 5.8G: 5725-5850 MHz(TX/RX) Bluetooth: 2402-2480MHz(TX/RX) NFC: 13.56MHz
Dimensions (L*W*H):	164mm (L) *76mm (W) *8mm (H)
Rated Input Voltage:	DC3.8V from Rechargeable Battery
Serial Number:	2M31-1
Normal Operation:	Head and Body
EUT Received Date:	2024/05/30
Test Date:	2024/08/03 ~ 2024/08/06
EUT Received Status:	Good

2. REFERENCE, STANDARDS, AND GUIDELINES

FCC:

The Report and Order requires routine SAR evaluation prior to equipment authorization of portable transmitter devices, including portable telephones. For consumer products, the applicable limit is 1.6 mW/g as recommended by the ANSI/IEEE standard C95.1-1992 [6] for an uncontrolled environment (Paragraph 65). According to the Supplement C of OET Bulletin 65 "Evaluating Compliance with FCC Guide-lines for Human Exposure to Radio frequency Electromagnetic Fields", released on Jun 29, 2001 by the FCC, the device should be evaluated at maximum output power (radiated from the antenna) under "worst-case" conditions for normal or intended use, incorporating normal antenna operating positions, device peak performance frequencies and positions for maximum RF energy coupling.

This report describes the methodology and results of experiments performed on wireless data terminal. The objective was to determine if there is RF radiation and if radiation is found, what is the extent of radiation with respect to safety limits. SAR (Specific Absorption Rate) is the measure of RF exposure determined by the amount of RF energy absorbed by human body (or its parts) – to determine how the RF energy couples to the body or head which is a primary health concern for body worn devices. The limit below which the exposure to RF is considered safe by regulatory bodies in North America is 1.6 mW/g average over 1 gram of tissue mass.

2.1 SAR Limits

FCC Limit

EXPOSURE LIMITS	SAR (W/kg)	
	(General Population / Uncontrolled Exposure Environment)	(Occupational / Controlled Exposure Environment)
Spatial Average (averaged over the whole body)	0.08	0.4
Spatial Peak (averaged over any 1 g of tissue)	**1.60**	8.0
Spatial Peak (hands/wrists/feet/ankles averaged over 10 g)	4.0	20.0

Population/Uncontrolled Environments are defined as locations where there is the exposure of individual who have no knowledge or control of their exposure.

Occupational/Controlled Environments are defined as locations where there is exposure that may be incurred by people who are aware of the potential for exposure (i.e. as a result of employment or occupation).

General Population/Uncontrolled environments Spatial Peak limit 1.6W/kg (FCC) applied to the EUT.

2.2 Test Facility

The Test site used by Bay Area Compliance Laboratories Corp. (Dongguan) to collect test data is located on the No.12, Pulong East 1st Road, Tangxia Town, Dongguan, Guangdong, China.

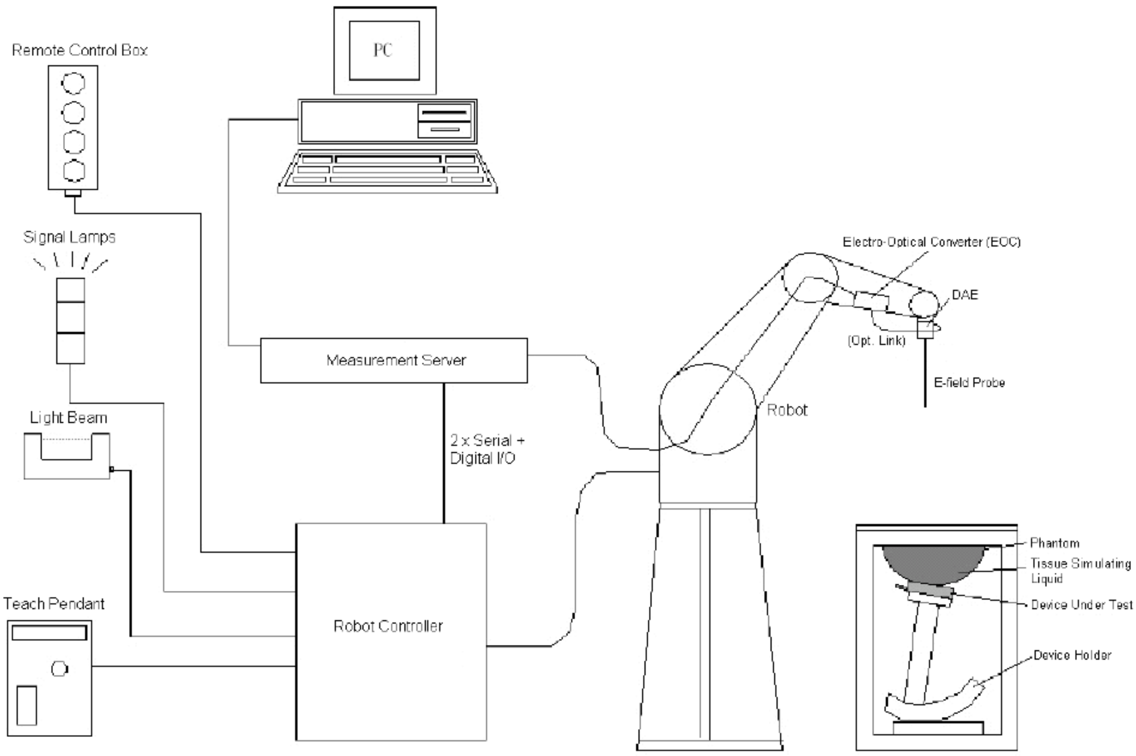
The lab has been recognized as the FCC accredited lab under the KDB 974614 D01 and is listed in the FCC Public Access Link (PAL) database, FCC Registration No. : 829273, the FCC Designation No. : CN5044.

3. DESCRIPTION OF TEST SYSTEM

These measurements were performed with the automated near-field scanning system DASY5 from Schmid & Partner Engineering AG (SPEAG) which is the Fifth generation of the system shown in the figure hereinafter:

DASY5 System Description

The DASY5 system for performing compliance tests consists of the following items:



- A standard high precision 6-axis robot with controller, teach pendant and software. An arm extension for accommodating the data acquisition electronics (DAE).
- An isotropic field probe optimized and calibrated for the targeted measurement.
- A data acquisition electronics (DAE) which performs the signal application, signal multiplexing, AD-conversion, offset measurements, mechanical surface detection, collision detection, etc. The unit is battery powered with standard or rechargeable batteries. The signal is optically transmitted to the EOC.
- The Electro-optical converter (EOC) performs the conversion from optical to electrical signals for the digital communication to the DAE. To use optical surface detection, a special version of the EOC is required. The EOC signal is transmitted to the measurement server.
- The function of the measurement server is to perform the time critical tasks such as signal filtering, control of the robot operation and fast movement interrupts.
- The Light Beam used is for probe alignment. This improves the (absolute) accuracy of the probe positioning.
- A computer running Win7 professional operating system and the DASY52 software.
- Remote control and teach pendant as well as additional circuitry for robot safety such as warning lamps, etc.
- The phantom, the device holder and other accessories according to the targeted measurement.

DASY5 Measurement Server

The DASY5 measurement server is based on a PC/104 CPU board with a 400MHz Intel ULV Celeron, 128MB chip-disk and 128MB RAM. The necessary circuits for communication with the DAE4 (or DAE3) electronics box, as well as the 16 bit AD-converter system for optical detection and digital I/O interface are contained on the DASY5 I/O board, which is directly connected to the PC/104 bus of the CPU board.

The measurement server performs all real-time data evaluation of field measurements and surface detection, controls robot movements and handles safety operation. The PC operating system cannot interfere with these time critical processes. All connections are supervised by a watchdog, and disconnection of any of the cables to the measurement server will automatically disarm the robot and disable all program-controlled robot movements. Furthermore, the measurement server is equipped with an expansion port which is reserved for future applications. Please note that this expansion port does not have a standardized point out, and therefore only devices provided by SPEAG can be connected. Devices from any other supplier could seriously damage the measurement server.

Data Acquisition Electronics

The data acquisition electronics (DAE4) consist of a highly sensitive electrometer-grade preamplifier with auto-zeroing, a channel and gain-switching multiplexer, a fast 16 bit AD-converter and a command decoder with a control logic unit. Transmission to the measurement server is accomplished through an optical downlink for data and status information, as well as an optical uplink for commands and the clock.

The mechanical probe mounting device includes two different sensor systems for frontal and sideways probe contacts. They are used for mechanical surface detection and probe collision detection.

The input impedance of both the DAE4 as well as of the DAE3 box is 200MOhm; the inputs are symmetrical and floating. Common mode rejection is above 80 dB.

EX3DV4 E-Field Probes

Frequency	4 MHz – 10 GHz Linearity: ± 0.2 dB (30 MHz – 10 GHz)
Directivity(typical)	± 0.1 dB in TSL (rotation around probe axis) ± 0.3 dB in TSL (rotation normal to probe axis)
Dynamic Range	10 µW/g – > 100 mW/g Linearity: ± 0.2 dB (noise: typically < 1 µW/g)
Dimensions	Overall length: 337 mm (tip: 20 mm) Tip diameter: 2.5 mm (body: 12 mm) Typical distance from probe tip to dipole centers: 1 mm
Applications	High precision dosimetric measurements in any exposure scenario (e.g., very strong gradient fields); the only probe that enables compliance testing for frequencies up to 6 GHz with precision of better 30%.
Compatibility	DASY3, DASY4, DASY52, DASY6, DASY8, EASY6, EASY4/MRI

SAM Twin Phantom

The SAM twin phantom is a fiberglass shell phantom with 2mm shell thickness (except the ear region, where shell thickness increases to 6 mm). The phantom has three measurement areas:
_ Left Head
_ Right Head
_ Flat phantom

The phantom table for the DASY systems based on the robots have the size of 100 x 50 x 85 cm (L x W x H).
For easy dislocation these tables have fork lift cut outs at the bottom.
The bottom plate contains three pairs of bolts for locking the device holder. The device holder positions are adjusted to the standard measurement positions in the three sections. Only one device holder is necessary if two phantoms are used (e.g., for different liquids)

A white cover is provided to cover the phantom during off-periods to prevent water evaporation and changes in the liquid parameters. Free space scans of devices on top of this phantom cover are possible. Three reference marks are provided on the phantom counter. These reference marks are used to teach the absolute phantom position relative to the robot.

Robots

The DASY5 system uses the high precision industrial robot. The robot offers the same features important for our application:
- High precision (repeatability 0.02mm)
- High reliability (industrial design)
- Low maintenance costs (virtually maintenance free due to direct drive gears; no belt drives)
- Jerk-free straight movements (brushless synchrony motors; no stepper motors)
- Low ELF interference (motor control fields shielded via the closed metallic construction shields)

The above mentioned robots are controlled by the Staubli CS7MB robot controllers. All information regarding the use and maintenance of the robot arm and the robot controller is contained on the CDs delivered along with the robot. Paper manuals are available upon request direct from Staubli.

Area Scans

Area scans are defined prior to the measurement process being executed with a user defined variable spacing between each measurement point (integral) allowing low uncertainty measurements to be conducted. Scans defined for FCC applications utilize a 15mm 2 step integral, with 1.5mm interpolation used to locate the peak SAR area used for zoom scan assessments.

Where the system identifies multiple SAR peaks (which are within 25% of peak value) the system will provide the user with the option of assessing each peak location individually for zoom scan averaging.

Zoom Scan (Cube Scan Averaging)

The averaging zoom scan volume utilized in the DASY5 software is in the shape of a cube and the side dimension of a 1 g or 10 g mass is dependent on the density of the liquid representing the simulated tissue. A density of 1000 kg/m^3 is used to represent the head and body tissue density and not the phantom liquid density, in order to be consistent with the definition of the liquid dielectric properties, i.e. the side length of the 1g cube is 10mm,with the side length of the 10g cube is 21.5mm.

When the cube intersects with the surface of the phantom, it is oriented so that 3 vertices touch the surface of the shell or the center of a face is tangent to the surface. The face of the cube closest to the surface is modified in order to conform to the tangent surface.

The zoom scan integer steps can be user defined so as to reduce uncertainty, but normal practice for typical test applications (including FCC) utilize a physical step of 7 x7 x 7 (5mmx5mmx5mm) providing a volume of 30 mm in the X & Y & Z axis.

Tissue Dielectric Parameters for Head and Body Phantoms

The head tissue dielectric parameters recommended by the IEC 62209-1:2016

Recommended Tissue Dielectric Parameters for Head liquid

Table A.3 – Dielectric properties of the head tissue-equivalent liquid

Frequency MHz	Relative permittivity ε_r	Conductivity (σ) S/m
300	45,3	0,87
450	43,5	0,87
750	*41,9*	*0,89*
835	41,5	0,90
900	41,5	0,97
1 450	40,5	1,20
1 500	*40,4*	*1,23*
1 640	*40,2*	*1,31*
1 750	*40,1*	*1,37*
1 800	40,0	1,40
1 900	40,0	1,40
2 000	40,0	1,40
2 100	*39,8*	*1,49*
2 300	*39,5*	*1,67*
2 450	39,2	1,80
2 600	*39,0*	*1,96*
3 000	38,5	2,40
3 500	*37,9*	*2,91*
4 000	*37,4*	*3,43*
4 500	*36,8*	*3,94*
5 000	*36,2*	*4,45*
5 200	*36,0*	*4,66*
5 400	*35,8*	*4,86*
5 600	*35,5*	*5,07*
5 800	*35,3*	*5,27*
6 000	*35,1*	*5,48*

NOTE For convenience, permittivity and conductivity values at those frequencies which are not part of the original data provided by Drossos et al. [33] or the extension to 5 800 MHz are provided (i.e. the values shown *in italics*). These values were linearly interpolated between the values in this table that are immediately above and below these values, except the values at 6 000 MHz that were linearly extrapolated from the values at 3 000 MHz and 5 800 MHz.

4. EQUIPMENT LIST AND CALIBRATION

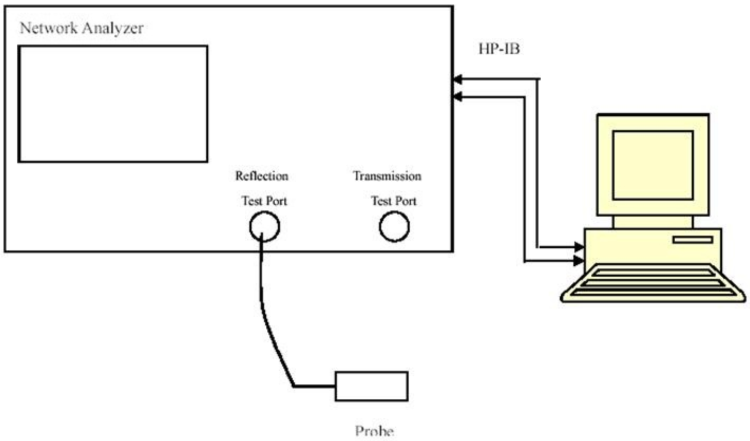
4.1 Equipments List & Calibration Information

Equipment	Model	S/N	Calibration Date	Calibration Due Date
DASY5 Test Software	DASY52.10	N/A	NCR	NCR
DASY5 Measurement Server	DASY5 4.5.12	1470	NCR	NCR
Data Acquisition Electronics	DAE4	772	2024/1/23	2025/1/22
E-Field Probe	EX3DV4	7839	2023/9/21	2024/9/20
Mounting Device	MD4HHTV5	SD 000 H01 KA	NCR	NCR
Twin SAM	Twin SAM V5.0	1874	NCR	NCR
Dipole, 750 MHz	D750V3	1167	2022/10/31	2025/10/30
Dipole, 1750 MHz	D1750V2	1141	2024/6/17	2027/6/16
Dipole, 1900 MHz	D1900V2	543	2022/11/2	2025/11/1
Dipole, 2450 MHz	D2450V2	971	2024/6/15	2027/6/14
Dipole, 2600 MHz	D2600V2	1132	2022/11/1	2025/10/31
Dipole, 5 GHz	D5GHzV2	1246	2022/11/1	2025/10/31
Simulated Tissue Liquid Head	HBBL600-10000V6	SL AAH U16 BC (Batch:220809-1)	Each Time	/
Network Analyzer	8753C	3033A02857	2023/11/18	2024/11/17
Dielectric assessment kit	1253	SM DAK 040 CA	NCR	NCR
synthesized signal generator	8665B	3438a00584	2023/10/18	2024/10/17
EPM Series Power Meter	E4419B	MY45103907	2023/10/18	2024/10/17
USB Wideband Power Sensor	U2022XA	MY54170006	2023/10/18	2024/10/17
Power Amplifier	ZHL-5W-202-S+	416402204	NCR	NCR
Power Amplifier	ZVE-6W-83+	637202210	NCR	NCR
Directional Coupler	441493	520Z	NCR	NCR
Attenuator	20dB, 100W	LN749	NCR	NCR
Attenuator	6dB, 150W	2754	NCR	NCR
Thermometer	DTM3000	3635	2023/8/11	2024/8/10
Hygrothermograph	HTC-2	EM072	2023/11/6	2024/11/5
Wireless communication tester	8960	MY50266471	2023/10/18	2024/10/17
Wideband Radio Communication Tester	CMW500	147473	2023/10/18	2024/10/17

* Statement of Traceability: Bay Area Compliance Laboratories Corp. (Dongguan) attests that all calibrations have been performed, traceable to National Primary Standards and International System of Units (SI).

5. SAR MEASUREMENT SYSTEM VERIFICATION

5.1 Liquid Verification



5.2 Liquid Verification Results

Frequency (MHz)	Liquid Type	Liquid Parameter		Target Value		Delta (%)		Tolerance (%)
		ε_r	σ (S/m)	ε_r	σ (S/m)	$\Delta\varepsilon_r$	Δσ (S/m)	
704	Simulated Tissue Liquid Head	42.557	0.881	42.15	0.89	0.97	-1.01	±5
707.5	Simulated Tissue Liquid Head	42.512	0.884	42.13	0.89	0.91	-0.67	±5
711	Simulated Tissue Liquid Head	42.469	0.886	42.11	0.89	0.85	-0.45	±5
750	Simulated Tissue Liquid Head	41.988	0.909	41.9	0.89	0.21	2.13	±5
782	Simulated Tissue Liquid Head	41.588	0.925	41.75	0.89	-0.39	3.93	±5

**Liquid Verification above was performed on 2024/08/03.*

Frequency (MHz)	Liquid Type	Liquid Parameter		Target Value		Delta (%)		Tolerance (%)
		ε_r	σ (S/m)	ε_r	σ (S/m)	$\Delta\varepsilon_r$	Δσ (S/m)	
1712.4	Simulated Tissue Liquid Head	39.395	1.309	40.13	1.35	-1.83	-3.04	±5
1720	Simulated Tissue Liquid Head	39.357	1.316	40.13	1.35	-1.93	-2.52	±5
1732.5	Simulated Tissue Liquid Head	39.311	1.328	40.12	1.36	-2.02	-2.35	±5
1732.6	Simulated Tissue Liquid Head	39.311	1.329	40.12	1.36	-2.02	-2.28	±5
1745	Simulated Tissue Liquid Head	39.259	1.341	40.1	1.37	-2.1	-2.12	±5
1750	Simulated Tissue Liquid Head	39.238	1.345	40.1	1.37	-2.15	-1.82	±5
1752.6	Simulated Tissue Liquid Head	39.227	1.348	40.09	1.37	-2.15	-1.61	±5

**Liquid Verification above was performed on 2024/08/04.*

Frequency (MHz)	Liquid Type	Liquid Parameter		Target Value		Delta (%)		Tolerance (%)
		ε_r	σ (S/m)	ε_r	σ (S/m)	$\Delta\varepsilon_r$	Δσ (S/m)	
1850.2	Simulated Tissue Liquid Head	41.23	1.431	40	1.4	3.08	2.21	±5
1860	Simulated Tissue Liquid Head	41.099	1.434	40	1.4	2.75	2.43	±5
1880	Simulated Tissue Liquid Head	41.011	1.436	40	1.4	2.53	2.57	±5
1900	Simulated Tissue Liquid Head	40.905	1.439	40	1.4	2.26	2.79	±5
1909.8	Simulated Tissue Liquid Head	40.874	1.44	40	1.4	2.19	2.86	±5

**Liquid Verification above was performed on 2024/08/05.*

Frequency (MHz)	Liquid Type	Liquid Parameter		Target Value		Delta (%)		Tolerance (%)
		ε_r	σ (S/m)	ε_r	σ (S/m)	$\Delta\varepsilon_r$	Δσ (S/m)	
2412	Simulated Tissue Liquid Head	40.332	1.79	39.28	1.77	2.68	1.13	±5
2442	Simulated Tissue Liquid Head	40.177	1.828	39.22	1.79	2.44	2.12	±5
2450	Simulated Tissue Liquid Head	40.127	1.839	39.2	1.8	2.36	2.17	±5
2472	Simulated Tissue Liquid Head	40.083	1.86	39.17	1.82	2.33	2.2	±5

**Liquid Verification above was performed on 2024/08/03.*

Frequency (MHz)	Liquid Type	Liquid Parameter		Target Value		Delta (%)		Tolerance (%)
		ε_r	σ (S/m)	ε_r	σ (S/m)	$\Delta\varepsilon_r$	Δσ (S/m)	
2506	Simulated Tissue Liquid Head	40.204	1.916	39.13	1.86	2.74	3.01	±5
2510	Simulated Tissue Liquid Head	40.195	1.921	39.12	1.86	2.75	3.28	±5
2535	Simulated Tissue Liquid Head	39.612	1.944	39.09	1.89	1.34	2.86	±5
2550	Simulated Tissue Liquid Head	38.315	1.956	39.07	1.91	-1.93	2.41	±5
2560	Simulated Tissue Liquid Head	38.226	1.96	39.05	1.92	-2.11	2.08	±5
2593	Simulated Tissue Liquid Head	38.136	1.99	39.01	1.95	-2.24	2.05	±5
2600	Simulated Tissue Liquid Head	38.112	1.997	39	1.96	-2.28	1.89	±5
2620	Simulated Tissue Liquid Head	38.023	2.001	38.98	1.98	-2.46	1.06	±5
2680	Simulated Tissue Liquid Head	37.864	2.084	38.9	2.05	-2.66	1.66	±5

**Liquid Verification above was performed on 2024/08/06.*

Frequency (MHz)	Liquid Type	Liquid Parameter		Target Value		Delta (%)		Tolerance (%)
		ε_r	σ (S/m)	ε_r	σ (S/m)	$\Delta\varepsilon_r$	Δσ (S/m)	
5180	Simulated Tissue Liquid Head	36.747	4.648	36.02	4.64	2.02	0.17	±5
5200	Simulated Tissue Liquid Head	36.8	4.667	36	4.66	2.22	0.15	±5
5240	Simulated Tissue Liquid Head	36.789	4.704	35.96	4.7	2.31	0.09	±5
5250	Simulated Tissue Liquid Head	36.759	4.712	35.95	4.71	2.25	0.04	±5

**Liquid Verification above was performed on 2024/08/04.*

Frequency (MHz)	**Liquid Type**	**Liquid Parameter**		**Target Value**		**Delta (%)**		**Tolerance (%)**
		ε_r	**Ơ (S/m)**	**ε_r**	**Ơ (S/m)**	**$\Delta\varepsilon_r$**	**ΔƠ (S/m)**	
5745	Simulated Tissue Liquid Head	35.896	5.21	35.36	5.22	1.52	-0.19	±5
5750	Simulated Tissue Liquid Head	35.875	5.215	35.35	5.22	1.49	-0.1	±5
5785	Simulated Tissue Liquid Head	35.797	5.246	35.32	5.26	1.35	-0.27	±5
5825	Simulated Tissue Liquid Head	35.768	5.353	35.28	5.3	1.38	1	±5

**Liquid Verification above was performed on 2024/08/05.*

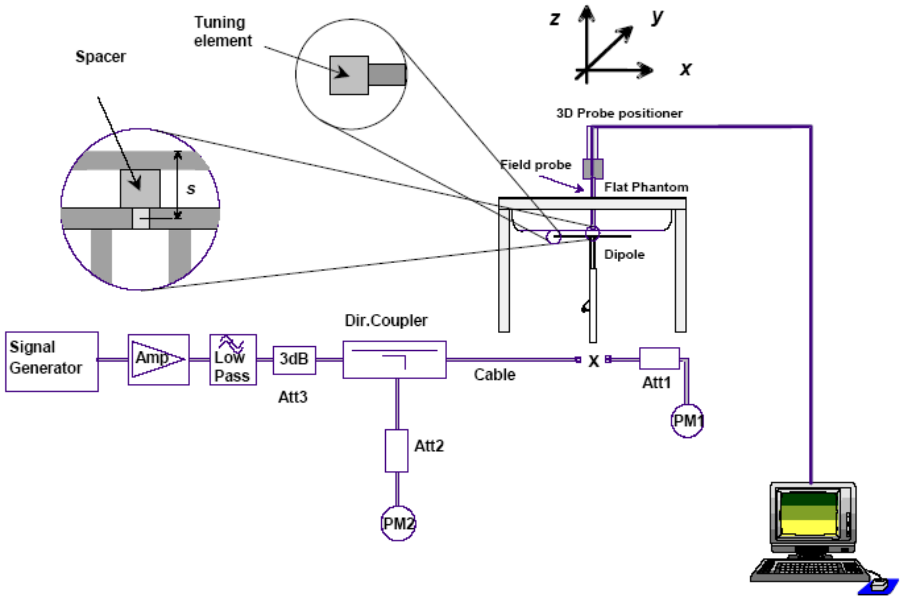
5.3 System Accuracy Verification

Prior to the assessment, the system validation kit was used to test whether the system was operating within its specifications of ±10%. The validation results are tabulated below. And also the corresponding SAR plot is attached as well in the SAR plots files.

The spacing distances in the **System Verification Setup Block Diagram** is given by the following:

a) s = 15 mm ± 0,2 mm for 300 MHz ≤ f ≤ 1 000 MHz;
b) s = 10 mm ± 0,2 mm for 1 000 MHz < f ≤ 3 000 MHz;
c) s = 10 mm ± 0,2 mm for 3 000 MHz < f ≤ 6 000 MHz.

System Verification Setup Block Diagram



5.4 System Accuracy Check Results

Date	Frequency Band	Liquid Type	Input Power (mW)	Measured SAR (W/kg)		Normalized to 1W (W/kg)	Target Value (W/kg)	Delta (%)	Tolerance (%)
2024/08/03	750 MHz	Simulated Tissue Liquid Head	100	1g	0.816	8.16	8.48	-3.77	±10
2024/08/04	1750 MHz	Simulated Tissue Liquid Head	100	1g	3.55	35.5	36.1	-1.66	±10
2024/08/05	1900 MHz	Simulated Tissue Liquid Head	100	1g	3.71	37.1	40.2	-7.71	±10
2024/08/03	2450 MHz	Simulated Tissue Liquid Head	100	1g	5.66	56.6	52.7	7.4	±10
2024/08/06	2600 MHz	Simulated Tissue Liquid Head	100	1g	5.92	59.2	55.8	6.09	±10
2024/08/04	5250 MHz	Simulated Tissue Liquid Head	100	1g	7.32	73.2	77.5	-5.55	±10
2024/08/05	5750 MHz	Simulated Tissue Liquid Head	100	1g	7.14	71.4	78.4	-8.93	±10

*The SAR values above are normalized to 1 Watt forward power.

5.5 SAR SYSTEM VALIDATION DATA

System Performance 750 MHz Head

DUT: D750V3; Type: 750 MHz; Serial: 1167

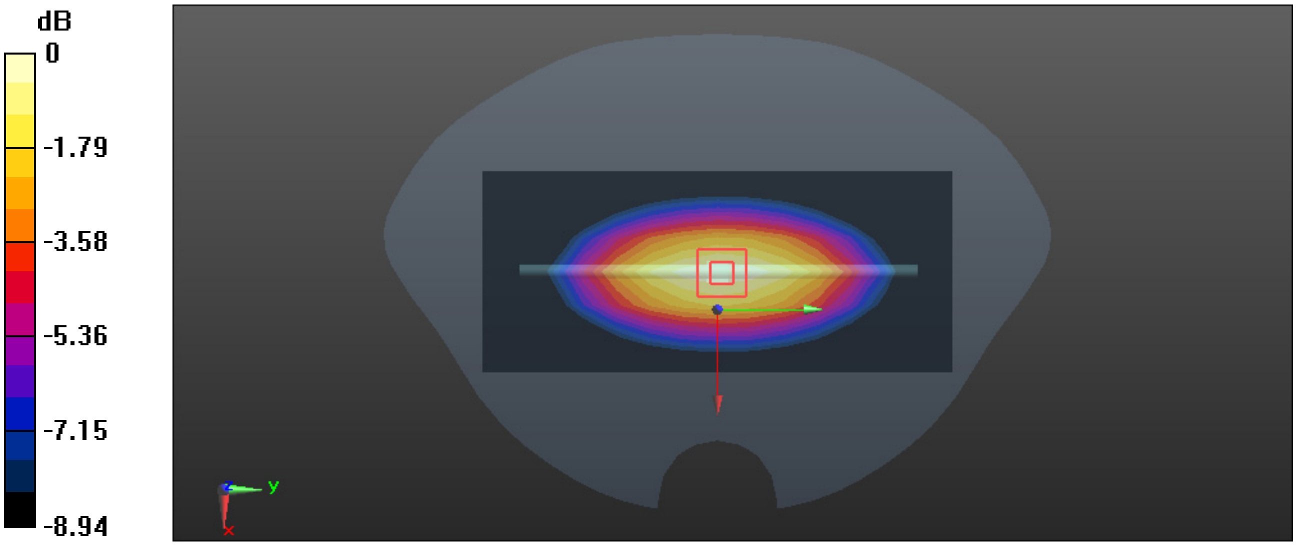
Communication System: CW; Frequency: 750 MHz;Duty Cycle: 1:1
Medium parameters used: f = 750 MHz; σ = 0.909 S/m; ε_r = 41.988; ρ = 1000 kg/m^3
Phantom section: Flat Section

DASY5 Configuration:

- Probe: EX3DV4 - SN7839; ConvF(9.95, 8.96, 8.82) @ 750 MHz; Calibrated: 2023/9/21
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn772; Calibrated: 2024/1/23
- Phantom: SAM (30deg probe tilt) with CRP v5.0_20150321; Type: QD000P40CD; Serial: TP:1874
- Measurement SW: DASY52, Version 52.10 (2); SEMCAD X Version 14.6.12 (7470)

Area Scan(7x15x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 0.946 W/kg

Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value =33.61 V/m; Power Drift = -0.15 dB
Peak SAR (extrapolated) = 1.22 W/kg
SAR(1 g) = 0.816 W/kg; SAR(10 g) = 0.564 W/kg
Maximum value of SAR (measured) = 0.949 W/kg



0 dB = 0.949 W/kg = -0.23 dBW/kg

System Performance 1750MHz Head

DUT: D1750V2; Type: 1750 MHz; Serial: 1141

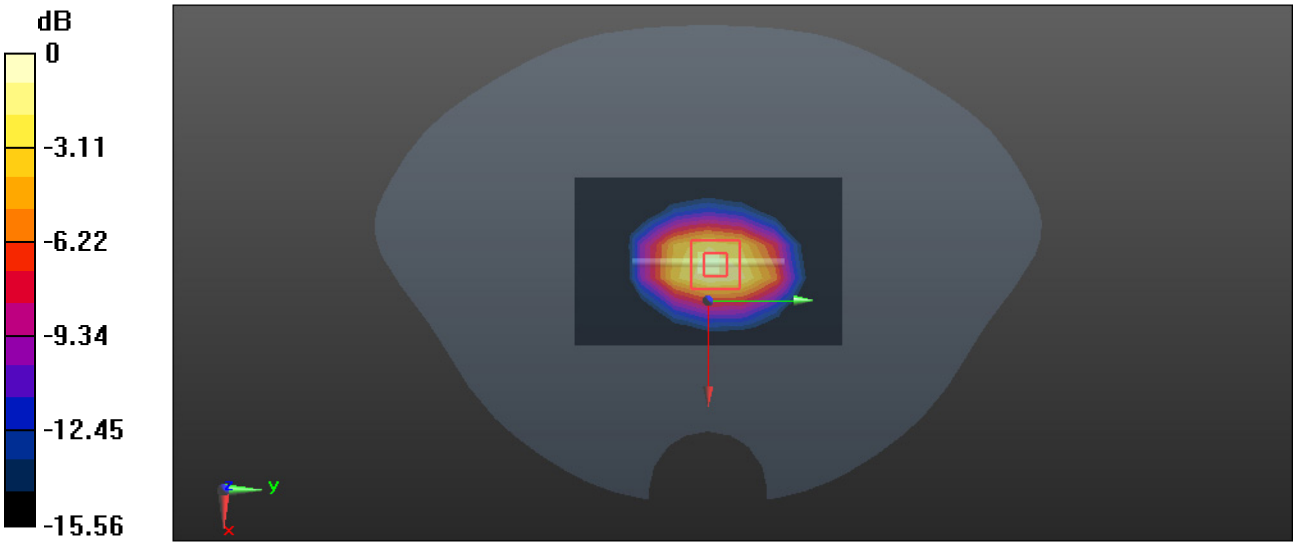
Communication System: CW ; Frequency: 1750 MHz;Duty Cycle: 1:1
Medium parameters used: f = 1750 MHz; σ = 1.345 S/m; ε_r = 39.238; ρ = 1000 kg/m^3
Phantom section: Flat Section

DASY5 Configuration:

- Probe: EX3DV4 - SN7839; ConvF(8.54, 7.65, 7.43) @ 1750 MHz; Calibrated: 2023/9/21
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn772; Calibrated: 2024/1/23
- Phantom: SAM (30deg probe tilt) with CRP v5.0_20150321; Type: QD000P40CD; Serial: TP:1874
- Measurement SW: DASY52, Version 52.10 (2); SEMCAD X Version 14.6.12 (7470)

Area Scan(6x9x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 3.72 W/kg

Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value =48.82 V/m; Power Drift = 0.11 dB
Peak SAR (extrapolated) = 5.26 W/kg
SAR(1 g) = 3.55 W/kg; SAR(10 g) = 1.89 W/kg
Maximum value of SAR (measured) = 3.89 W/kg



0 dB = 3.89 W/kg = 5.90 dBW/kg

System Performance 1900MHz Head

DUT: D1900V2; Type: 1900 MHz; Serial: 543

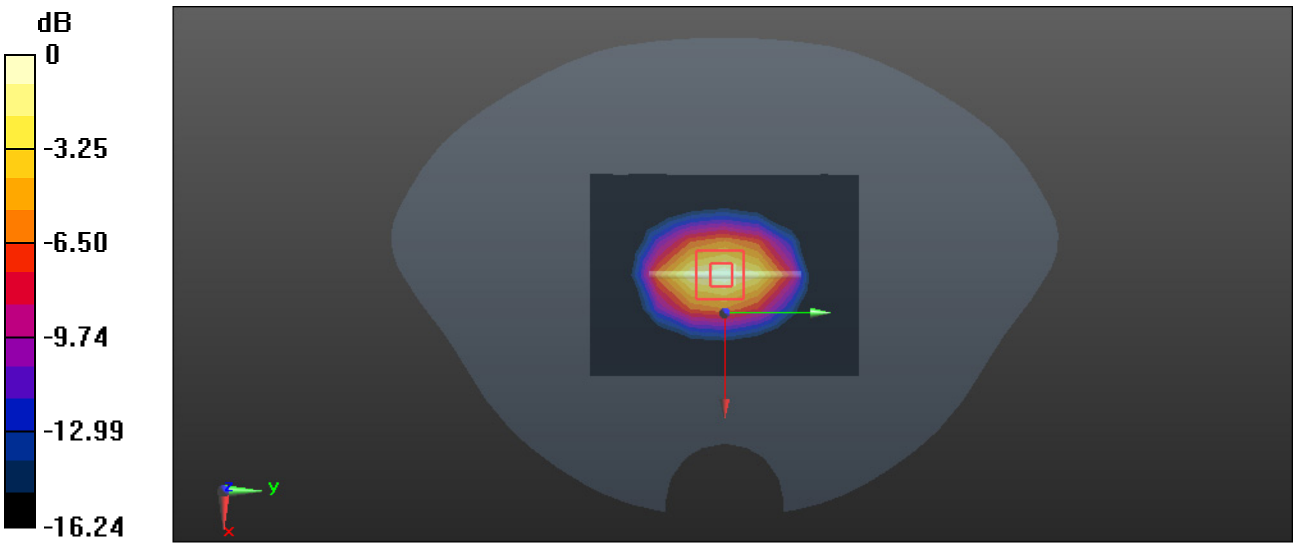
Communication System: CW ; Frequency: 1900 MHz;Duty Cycle: 1:1
Medium parameters used: f = 1900 MHz; σ = 1.439 S/m; ε_r = 40.905; ρ = 1000 kg/m^3
Phantom section: Flat Section

DASY5 Configuration:

- Probe: EX3DV4 - SN7839; ConvF(8, 7.27, 7.03) @ 1900 MHz; Calibrated: 2023/9/21
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn772; Calibrated: 2024/1/23
- Phantom: SAM (30deg probe tilt) with CRP v5.0_20150321; Type: QD000P40CD; Serial: TP:1874
- Measurement SW: DASY52, Version 52.10 (2); SEMCAD X Version 14.6.12 (7470)

Area Scan(7x9x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 4.67 W/kg

Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value =56.95 V/m; Power Drift =0.12 dB
Peak SAR (extrapolated) = 6.44 W/kg
SAR(1 g) = 3.71 W/kg; SAR(10 g) = 2.04 W/kg
Maximum value of SAR (measured) = 4.55 W/kg



0 dB = 4.55 W/kg = 6.58 dBW/kg

System Performance 2450MHz Head

DUT: D2450V2; Type: 2450 MHz; Serial: 971

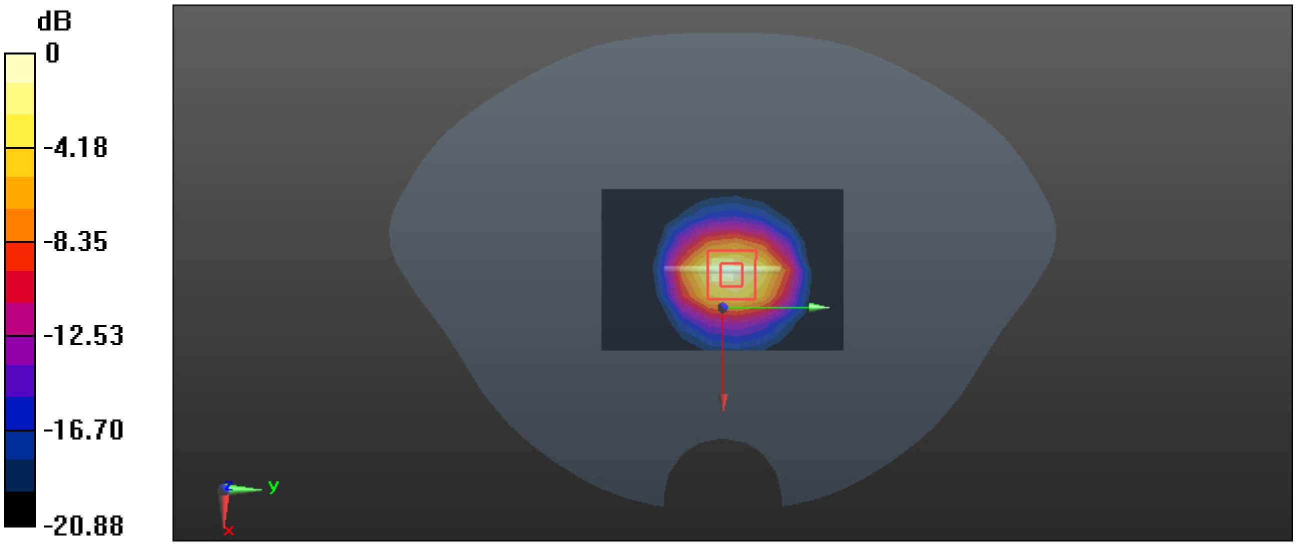
Communication System: CW; Frequency: 2450 MHz;Duty Cycle: 1:1
Medium parameters used : f = 2450 MHz; σ = 1.839 S/m; ε_r = 40.127; ρ = 1000 kg/m3
Phantom section: Flat Section

DASY5 Configuration:

- Probe: EX3DV4 - SN7839; ConvF(7.49, 6.81, 6.61) @ 2450 MHz; Calibrated: 2023/9/21
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn772; Calibrated: 2024/1/23
- Phantom: SAM (30deg probe tilt) with CRP v5.0_20150321; Type: QD000P40CD; Serial: TP:1874
- Measurement SW: DASY52, Version 52.10 (2); SEMCAD X Version 14.6.12 (7470)

Area Scan(7x10x1): Measurement grid: dx=12mm, dy=12mm
Maximum value of SAR (measured) = 7.13 W/kg

Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value =60.55 V/m; Power Drift =0.19 dB
Peak SAR (extrapolated) = 12.3 W/kg
SAR(1 g) = 5.66 W/kg; SAR(10 g) = 2.51 W/kg
Maximum value of SAR (measured) = 7.52 W/kg



0 dB = 7.52 W/kg = 8.76 dBW/kg

System Performance 2600MHz Head

DUT: D2600V2; Type: 2600 MHz; Serial: 1132

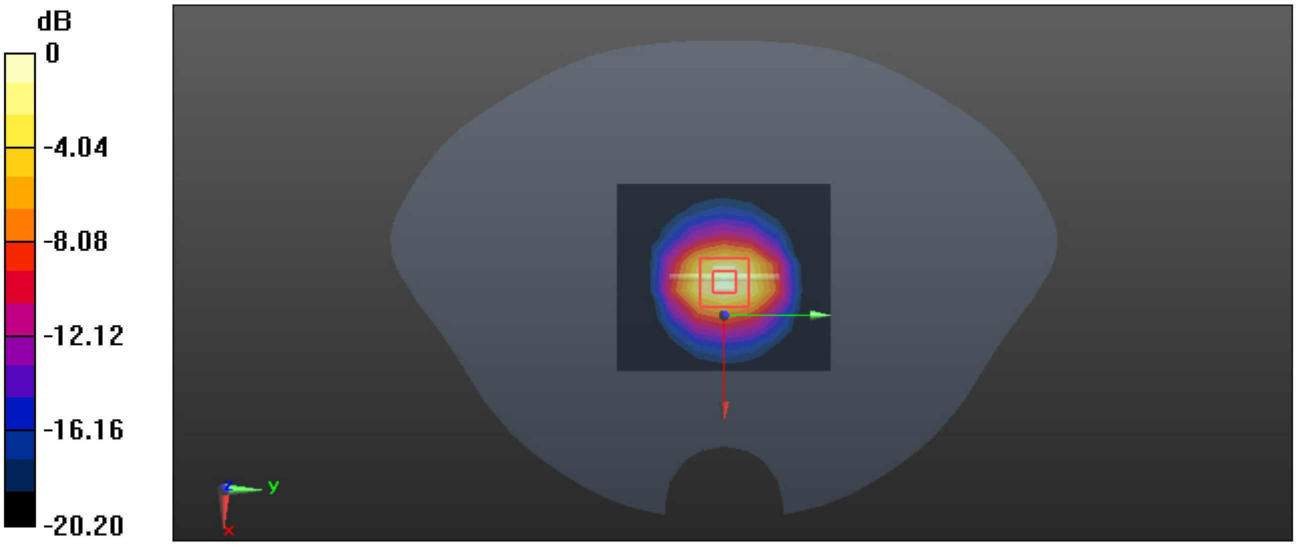
Communication System: CW ; Frequency: 2600 MHz;Duty Cycle: 1:1
Medium parameters used: f = 2600 MHz; σ = 1.997 S/m; ε_r = 38.112; ρ = 1000 kg/m^3
Phantom section: Flat Section

DASY5 Configuration:

- Probe: EX3DV4 - SN7839; ConvF(7.61, 6.94, 6.73) @ 2600 MHz; Calibrated: 2023/9/21
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn772; Calibrated: 2024/1/23
- Phantom: SAM (30deg probe tilt) with CRP v5.0_20150321; Type: QD000P40CD; Serial: TP:1874
- Measurement SW: DASY52, Version 52.10 (2); SEMCAD X Version 14.6.12 (7470)

Area Scan(8x9x1): Measurement grid: dx=12mm, dy=12mm
Maximum value of SAR (measured) = 6.96 W/kg

Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value =63.42 V/m; Power Drift =0.16 dB
Peak SAR (extrapolated) = 11.8 W/kg
SAR(1 g) = 5.92 W/kg; SAR(10 g) = 2.75 W/kg
Maximum value of SAR (measured) = 7.77 W/kg



0 dB = 7.77 W/kg = 8.90 dBW/kg

System Performance 5250 MHz Head

DUT: D5GHzV2; Type: 5250 MHz; Serial: 1246

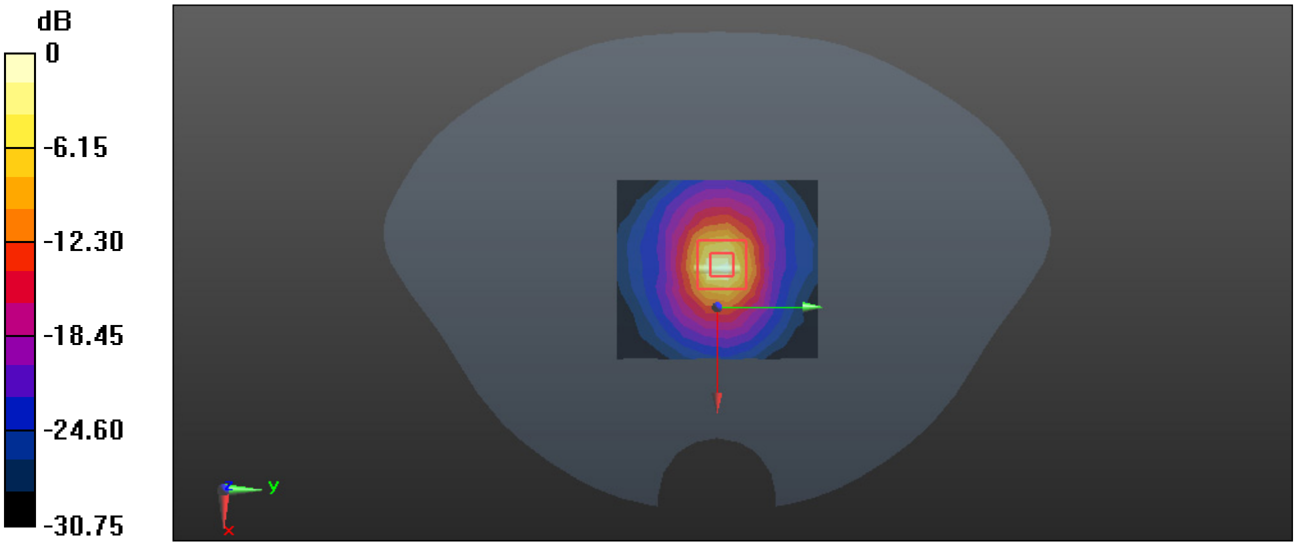
Communication System: CW; Frequency: 5250 MHz;Duty Cycle: 1:1
Medium parameters used: f = 5250 MHz; σ = 4.712 S/m; ε_r = 36.759; ρ = 1000 kg/m^3
Phantom section: Flat Section

DASY5 Configuration:

- Probe: EX3DV4 - SN7839; ConvF(5.62, 5.1, 4.97) @ 5250 MHz; Calibrated: 2023/9/21
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn772; Calibrated: 2024/1/23
- Phantom: SAM (30deg probe tilt) with CRP v5.0_20150321; Type: QD000P40CD; Serial: TP:1874
- Measurement SW: DASY52, Version 52.10 (2); SEMCAD X Version 14.6.12 (7470)

Area Scan(9x10x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (measured) = 13.9 W/kg

Zoom Scan (8x8x16)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2mm
Reference Value =46.94 V/m; Power Drift = 0.17 dB
Peak SAR (extrapolated) = 25.4 W/kg
SAR(1 g) = 7.32 W/kg; SAR(10 g) = 2.16 W/kg
Maximum value of SAR (measured) = 17.6 W/kg



0 dB = 17.6 W/kg = 12.46 dBW/kg

System Performance 5750 MHz Head

DUT: D5GHzV2; Type: 5750 MHz; Serial: 1246

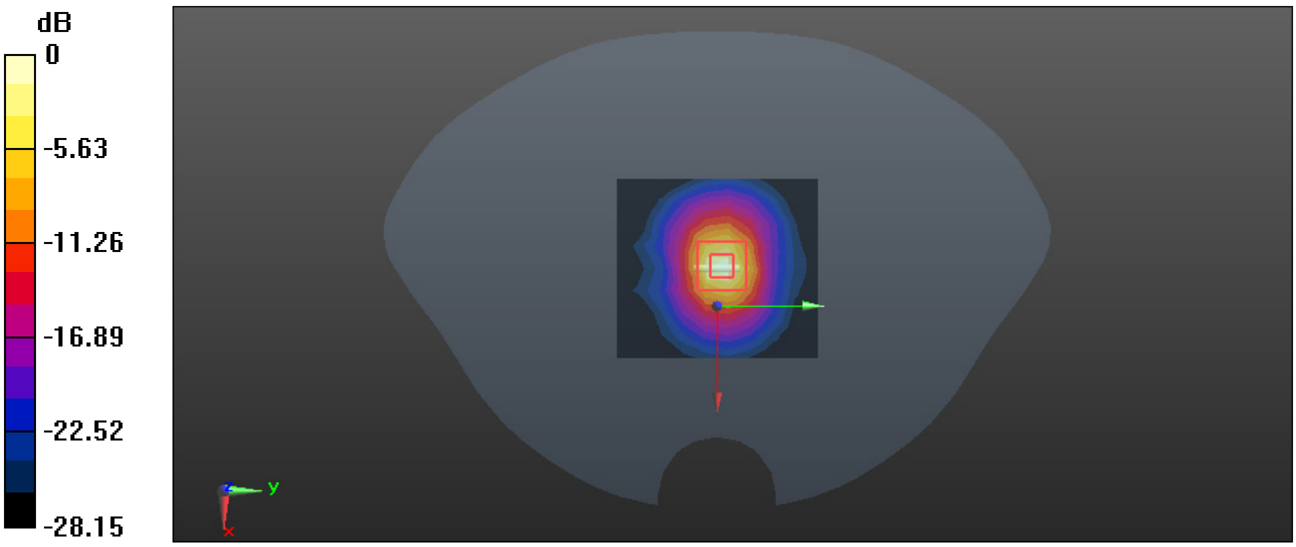
Communication System: CW; Frequency: 5750 MHz;Duty Cycle: 1:1
Medium parameters used: f = 5750 MHz; σ = 5.215 S/m; ε_r = 35.875; ρ = 1000 kg/m^3
Phantom section: Flat Section

DASY5 Configuration:

- Probe: EX3DV4 - SN7839; ConvF(5.04, 4.65, 4.62) @ 5750 MHz; Calibrated: 2023/9/21
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn772; Calibrated: 2024/1/23
- Phantom: SAM (30deg probe tilt) with CRP v5.0_20150321; Type: QD000P40CD; Serial: TP:1874
- Measurement SW: DASY52, Version 52.10 (2); SEMCAD X Version 14.6.12 (7470)

Area Scan(9x10x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (measured) = 16.4 W/kg

Zoom Scan (8x8x16)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2mm
Reference Value =39.46 V/m; Power Drift =0.13 dB
Peak SAR (extrapolated) = 27.8 W/kg
SAR(1 g) = 7.14 W/kg; SAR(10 g) = 1.99 W/kg
Maximum value of SAR (measured) = 15.6 W/kg



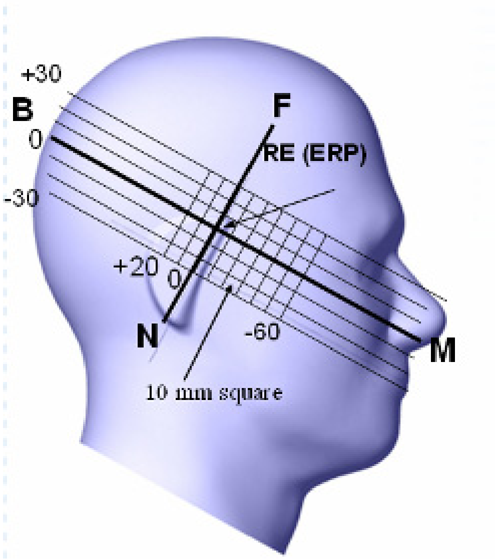
0 dB = 15.6 W/kg = 11.93 dBW/kg

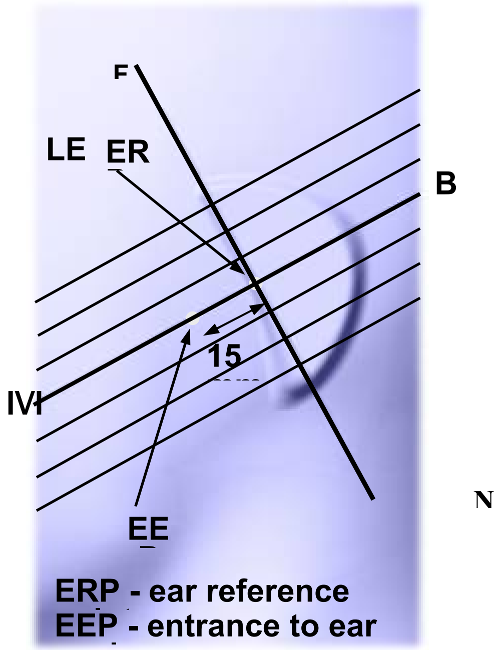
6. EUT TEST STRATEGY AND METHODOLOGY

6.1 Test Positions for Device Operating Next to a Person's Ear

This category includes most wireless handsets with fixed, retractable or internal antennas located toward the top half of the device, with or without a foldout, sliding or similar keypad cover. The handset should have its earpiece located within the upper ¼ of the device, either along the centerline or off-centered, as perceived by its users. This type of handset should be positioned in a normal operating position with the "test device reference point" located along the "vertical centerline" on the front of the device aligned to the "ear reference point". The "test device reference point" should be located at the same level as the center of the earpiece region. The "vertical centerline" should bisect the front surface of the handset at its top and bottom edges. A "ear reference point" is located on the outer surface of the head phantom on each ear spacer. It is located 1.5 cm above the center of the ear canal entrance in the "phantom reference plane" defined by the three lines joining the center of each "ear reference point" (left and right) and the tip of the mouth.

A handset should be initially positioned with the earpiece region pressed against the ear spacer of a head phantom. For the SCC-34/SC-2 head phantom, the device should be positioned parallel to the "N-F" line defined along the base of the ear spacer that contains the "ear reference point". For interim head phantoms, the device should be positioned parallel to the cheek for maximum RF energy coupling. The "test device reference point" is aligned to the "ear reference point" on the head phantom and the "vertical centerline" is aligned to the "phantom reference plane". This is called the "initial ear position". While maintaining these three alignments, the body of the handset is gradually adjusted to each of the following positions for evaluating SAR:





6.2 Cheek/Touch Position

The device is brought toward the mouth of the head phantom by pivoting against the "ear reference point" or along the "N-F" line for the SCC-34/SC-2 head phantom.

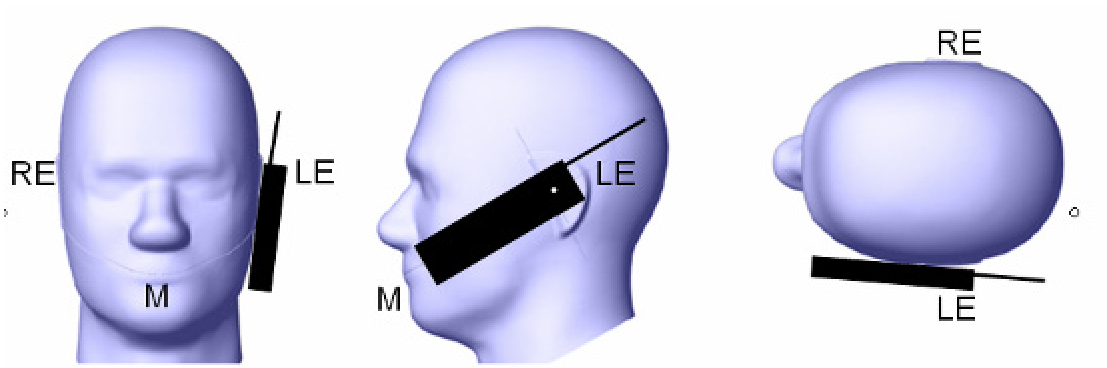
This test position is established:

When any point on the display, keypad or mouthpiece portions of the handset is in contact with the phantom.

(or) When any portion of a foldout, sliding or similar keypad cover opened to its intended self-adjusting normal use position is in contact with the cheek or mouth of the phantom.

For existing head phantoms – when the handset loses contact with the phantom at the pivoting point, rotation should continue until the device touches the cheek of the phantom or breaks its last contact from the ear spacer.

Cheek /Touch Position



6.3 Ear/Tilt Position

With the handset aligned in the "Cheek/Touch Position":

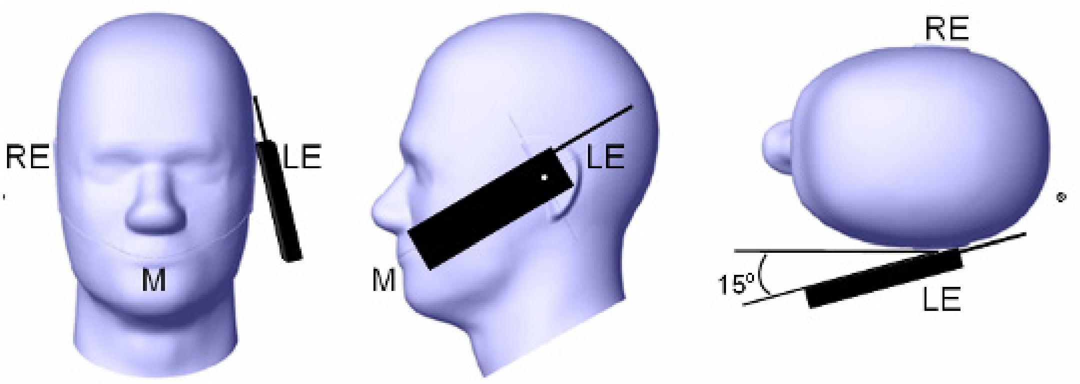
1) If the earpiece of the handset is not in full contact with the phantom's ear spacer (in the "Cheek/Touch position") and the peak SAR location for the "Cheek/Touch" position is located at the ear spacer region or corresponds to the earpiece region of the handset, the device should be returned to the "initial ear position" by rotating it away from the mouth until the earpiece is in full contact with the ear spacer.

2) (otherwise) The handset should be moved (translated) away from the cheek perpendicular to the line passes through both "ear reference points" (note: one of these ear reference points may not physically exist on a split head model) for approximate 2-3 cm. While it is in this position, the device handset is tilted away from the mouth with respect to the "test device reference point" until the inside angle between the vertical centerline on the front surface of the phone and the horizontal line passing through the ear reference point is by 15 80°. After the tilt, it is then moved (translated) back toward the head perpendicular to the line passes through both "ear reference points" until the device touches the phantom or the ear spacer. If the antenna touches the head first, the positioning process should be repeated with a tilt angle less than 15° so that the device and its antenna would touch the phantom simultaneously. This test position may require a device holder or positioner to achieve the translation and tilting with acceptable positioning repeatability.

If a device is also designed to transmit with its keypad cover closed for operating in the head position, such positions should also be considered in the SAR evaluation. The device should be tested on the left and right side of the head phantom in the "Cheek/Touch" and "Ear/Tilt" positions. When applicable, each configuration should be tested with the antenna in its fully extended and fully retracted positions.

These test configurations should be tested at the high, middle and low frequency channels of each operating mode; for example, AMPS, CDMA, and TDMA. If the SAR measured at the middle channel for each test configuration (left, right, Cheek/Touch, Tilt/Ear, extended and retracted) is at least 2.0 dB lower than the SAR limit, testing at the high and low channels is optional for such test configuration(s). If the transmission band of the test device is less than 10 MHz, testing at the high and low frequency channels is optional.

Ear /Tilt 15° Position



6.4 Test positions for body-worn and other configurations

Body-worn operating configurations should be tested with the belt-clips and holsters attached to the device and positioned against a flat phantom in normal use configurations. Devices with a headset output should be tested with a headset connected to the device. When multiple accessories that do not contain metallic components are supplied with the device, the device may be tested with only the accessory that dictates the closest spacing to the body. When multiple accessories that contain metallic components are supplied with the device, the device must be tested with each accessory that contains a unique metallic component. If multiple accessories share an identical metallic component (e.g., the same metallic belt-clip used with different holsters with no other metallic components), only the accessory that dictates the closest spacing to the body must be tested.

Body-worn accessories may not always be supplied or available as options for some devices that are intended to be authorized for body-worn use. A separation distance of 1.5 cm between the back of the device and a flat phantom is recommended for testing body-worn SAR compliance under such circumstances. Other separation distances may be used, but they should not exceed 2.5 cm. In these cases, the device may use body-worn accessories that provide a separation distance greater than that tested for the device provided however that the accessory contains no metallic components.

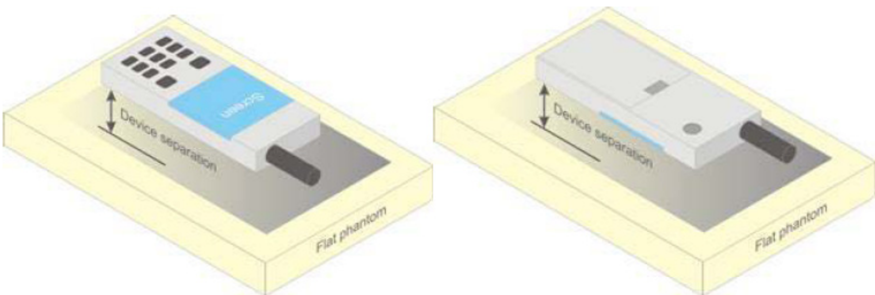


Figure 5 – Test positions for body-worn devices

6.5 Test Distance for SAR Evaluation

In this case the EUT(Equipment Under Test) is set 10mm away from the phantom, the test distance is 10mm.

6.6 SAR Evaluation Procedure

The evaluation was performed with the following procedure:

Step 1: Measurement of the SAR value at a fixed location above the ear point or central position was used as a reference value for assessing the power drop. The SAR at this point is measured at the start of the test and then again at the end of the testing.

Step 2: The SAR distribution at the exposed side of the head was measured at a distance of 4 mm from the inner surface of the shell. The area covered the entire dimension of the head or radiating structures of the EUT, the horizontal grid spacing was 15 mm x 15 mm, and the SAR distribution was determined by integrated grid of 1.5mm x 1.5mm. Based on these data, the area of the maximum absorption was determined by spline interpolation. The first Area Scan covers the entire dimension of the EUT to ensure that the hotspot was correctly identified.

Step 3: Around this point, a volume of 30 mm x 30 mm x 30 mm was assessed by measuring 7x 7 x 7 points. On the basis of this data set, the spatial peak SAR value was evaluated under the following procedure:

1) The data at the surface were extrapolated, since the center of the dipoles is 1.2 mm away from the tip of the probe and the distance between the surface and the lowest measuring point is 1.3 mm. The extrapolation was based on a least square algorithm. A polynomial of the fourth order was calculated through the points in z-axes. This polynomial was then used to evaluate the points between the surface and the probe tip.

2) The maximum interpolated value was searched with a straightforward algorithm. Around this maximum the SAR values averaged over the spatial volumes (1 g or 10 g) were computed by the 3D-Spline interpolation algorithm. The 3D-Spline is composed of three one dimensional splines with the “Not a knot"-condition (in x, y and z-directions). The volume was integrated with the trapezoidal-algorithm. One thousand points (10 x 10 x 10) were interpolated to calculate the averages.

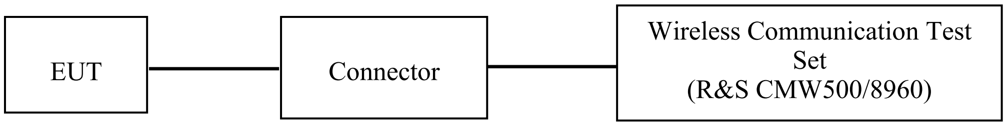
All neighboring volumes were evaluated until no neighboring volume with a higher average value was found.

Step 4: Re-measurement of the SAR value at the same location as in Step 1. If the value changed by more than 5%, the evaluation was repeated.

7. CONDUCTED OUTPUT POWER MEASUREMENT

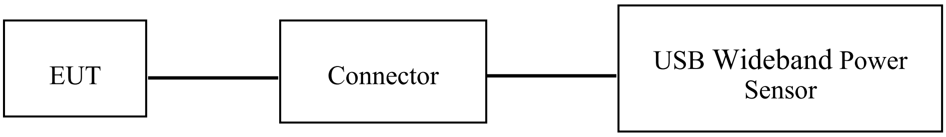
7.1 Test Procedure

The RF output of the transmitter was connected to the input of the Wireless Communication Test Set through Connector.



GSM/WCDMA/LTE

The RF output of the transmitter was connected to the input port of the USB Wideband Power Sensor through Connector.



WLAN/BT

7.2 Radio Configuration

The power measurement was configured by the Wireless Communication Test Set.

GSM/GPRS/EGPRS

Function: Menu select > GSM Mobile Station > GSM 850/1900
Press Connection control to choose the different menus
Press RESET > choose all the reset all settings
Connection Press Signal Off to turn off the signal and change settings
Network Support > GSM + GPRS or GSM + EGSM
Main Service > Packet Data
Service selection > Test Mode A – Auto Slot Config. off
MS Signal Press Slot Config Bottom on the right twice to select and change the number of time slots and power setting

    > Slot configuration > Uplink/Gamma
    > 33 dBm for GPRS 850
    > 30 dBm for GPRS 1900
    > 27 dBm for EGPRS 850
    > 26 dBm for EGPRS 1900

BS Signal Enter the same channel number for TCH channel (test channel) and BCCH channel
Frequency Offset > + 0 Hz
Mode > BCCH and TCH
BCCH Level > -85 dBm (May need to adjust if link is not stabe)
BCCH Channel > choose desire test channel [Enter the same channel number for TCH channel (test channel) and BCCH channel]

Channel Type > Off
P0 > 4 dB
Slot Config >Unchanged (if already set under MS signal)
TCH > choose desired test channel
Hopping > Off

Main Timeslot > 3
Network Coding Scheme > CS4 (GPRS) and MCS5 (EGPRS)
Bit Stream >2E9-1 PSR Bit Stream
AF/RF Enter appropriate offsets for Ext. Att. Output and Ext. Att. Input
Connection Press Signal on to turn on the signal and change settings

WCDMA Release 99

The following tests were conducted according to the test requirements outlines in section 5.2 of the 3GPP
TS34.121-1 specification. The EUT has a nominal maximum output power of 24dBm (+1.7/-3.7).

WCDMA General Settings	Loopback Mode	Test Mode 1
	Rel99 RMC	12.2kbps RMC
	Power Control Algorithm	Algorithm2
	β_c/β_d	8/15

HSDPA

The following tests were conducted according to the test requirements outlines in section 5.2 of the 3GPP
TS34.121-1 specification.

	Mode	HSDPA	HSDPA	HSDPA	HSDPA
	Subset	1	2	3	4
WCDMA General Settings	Loopback Mode	Test Mode 1			
	Rel99 RMC	12.2kbps RMC			
	HSDPA FRC	H-Set1			
	Power Control Algorithm	Algorithm2			
	β_c	2/15	12/15	15/15	15/15
	β_d	15/15	15/15	8/15	4/15
	β_d(SF)	64			
	β_c/β_d	2/15	12/15	15/8	15/4
	β_{hs}	4/15	24/15	30/15	30/15
	MPR(dB)	0	0	0.5	0.5
HSDPA Specific Settings	DACK	8			
	DNAK	8			
	DCQI	8			
	Ack-Nack repetition factor	3			
	CQI Feedback	4ms			
	CQI Repetition Factor	2			
	Ahs=βhs/ βc	30/15			

HSUPA

The following tests were conducted according to the test requirements outlines in section 5.2 of the 3GPP
TS34.121-1 specification.

	Mode	HSUPA	HSUPA	HSUPA	HSUPA	HSUPA
	Subset	**1**	**2**	**3**	**4**	**5**
WCDMA General Settings	Loopback Mode	Test Mode 1				
	Rel99 RMC	12.2kbps RMC				
	HSDPA FRC	H-Set1				
	HSUPA Test	HSUPA Loopback				
	Power Control Algorithm	Algorithm2				
	β_c	11/15	6/15	15/15	2/15	15/15
	β_d	15/15	15/15	9/15	15/15	0
	β_{ec}	209/225	12/15	30/15	2/15	5/15
	β_c/β_d	11/15	6/15	15/9	2/15	-
	β_{hs}	22/15	12/15	30/15	4/15	5/15
	CM(dB)	1.0	3.0	2.0	3.0	1.0
	MPR(dB)	0	2	1	2	0
HSDPA Specific Settings	DACK	8				
	DNAK	8				
	DCQI	8				
	Ack-Nack repetition factor	3				
	CQI Feedback	4ms				
	CQI Repetition Factor	2				
	$Ahs=\beta_{hs}/\beta_c$	30/15				
HSUPA Specific Settings	DE-DPCCH	6	8	8	5	7
	DHARQ	0	0	0	0	0
	AG Index	20	12	15	17	21
	ETFCI	75	67	92	71	81
	Associated Max UL Data Rate kbps	242.1	174.9	482.8	205.8	308.9
	Reference E_FCIs	E-TFCI 11 E E-TFCI PO 4 E-TFCI 67 E-TFCI PO 18 E-TFCI 71 E-TFCI PO23 E-TFCI 75 E-TFCI PO26 E-TFCI 81 E-TFCI PO 27		E-TFCI 11 E-TFCI PO4 E-TFCI 92 E-TFCI PO 18	E-TFCI 11 E E-TFCI PO 4 E-TFCI 67 E-TFCI PO 18 E-TFCI 71 E-TFCI PO23 E-TFCI 75 E-TFCI PO26 E-TFCI 81 E-TFCI PO 27	

DC-HSDPA

The following tests were conducted according to the test requirements in Table C.8.1.12 of 3GPP TS 34.121-1

Table C.8.1.12: Fixed Reference Channel H-Set 12

Parameter	Unit	Value
Nominal Avg. Inf. Bit Rate	kbps	60
Inter-TTI Distance	TTI's	1
Number of HARQ Processes	Processes	6
Information Bit Payload (N_{INF})	Bits	120
Number Code Blocks	Blocks	1
Binary Channel Bits Per TTI	Bits	960
Total Available SML's in UE	SML's	19200
Number of SML's per HARQ Proc.	SML's	3200
Coding Rate		0.15
Number of Physical Channel Codes	Codes	1
Modulation		QPSK
Note 1: The RMC is intended to be used for DC-HSDPA mode and both cells shall transmit with identical parameters as listed in the table. Note 2: Maximum number of transmission is limited to 1, i.e., retransmission is not allowed. The redundancy and constellation version 0 shall be used.		

HSPA+

Sub-test	β_c (Note3)	β_d	β_{HS} (Note1)	β_{ec}	β_{ed} (2xSF2) (Note 4)	β_{ed} (2xSF4) (Note 4)	CM (dB) (Note 2)	MPR (dB) (Note 2)	AG Index (Note 4)	E-TFCI (Note 5)	E-TFCI (boost)
1	1	0	30/15	30/15	β_{ed}1: 30/15 β_{ed}2: 30/15	β_{ed}3: 24/15 β_{ed}4: 24/15	3.5	2.5	14	105	105

Note 1: Δ_{ACK}, Δ_{NACK} and Δ_{CQI} = 30/15 with β_{hs} = 30/15 * β_c .
Note 2: CM = 3.5 and the MPR is based on the relative CM difference, MPR = MAX(CM-1,0).
Note 3: DPDCH is not configured, therefore the β_c is set to 1 and β_d = 0 by default.
Note 4: β_{ed} can not be set directly; it is set by Absolute Grant Value.
Note 5: All the sub-tests require the UE to transmit 2SF2+2SF4 16QAM EDCH and they apply for UE using E-DPDCH category 7. E-DCH TTI is set to 2ms TTI and E-DCH table index = 2. To support these E-DCH configurations DPDCH is not allocated. The UE is signalled to use the extrapolation algorithm.

The following tests were conducted according to the test requirements in Table C.11.1.4 of 3GPP TS 34.121-1

FDD-LTE

For UE Power Class 1 and 3, the allowed Maximum Power Reduction (MPR) for the maximum output power in Table 6.2.2-1due to higher order modulation and transmit bandwidth configuration (resource blocks) is specified in Table 6.2.3-1.

Table 6.2.3-1: Maximum Power Reduction (MPR) for Power Class 1 and 3

Modulation	Channel bandwidth / Transmission bandwidth (N_{RB})						MPR (dB)
	1.4 MHz	3.0 MHz	5 MHz	10 MHz	15 MHz	20 MHz	
QPSK	> 5	> 4	> 8	> 12	> 16	> 18	≤ 1
16 QAM	≤ 5	≤ 4	≤ 8	≤ 12	≤ 16	≤ 18	≤ 1
16 QAM	> 5	> 4	> 8	> 12	> 16	> 18	≤ 2

For UE Power Class 1 and 3 the specific requirements and identified sub clauses are specified in Table 6.2.4-1 along with the allowed A-MPR values that may be used to meet these requirements. The allowed A-MPR values specified below in Table 6.2.4.-1 to 6.2.4-15 are in addition to the allowed MPR requirements specified in sub clause 6.2.3.

Table 6.2.4-1: Additional Maximum Power Reduction (A-MPR)

Network Signalling value	Requirements (subclause)	E-UTRA Band	Channel bandwidth (MHz)	Resources Blocks (N_{RB})	A-MPR (dB)
NS_01	6.6.2.1.1	Table 5.5-1	1.4, 3, 5, 10, 15, 20	Table 5.6-1	N/A
NS_03	6.6.2.2.1	2, 4,10, 23, 25, 35, 36	3	>5	≤ 1
			5	>6	≤ 1
			10	>6	≤ 1
			15	>8	≤ 1
			20	>10	≤ 1
NS_04	6.6.2.2.2	41	5	>6	≤ 1
			10, 15, 20	Table 6.2.4-4	
NS_05	6.6.3.3.1	1	10,15,20	≥ 50	≤ 1
NS_06	6.6.2.2.3	12, 13, 14, 17	1.4, 3, 5, 10	Table 5.6-1	N/A
NS_07	6.6.2.2.3 6.6.3.3.2	13	10	Table 6.2.4-2	
NS_08	6.6.3.3.3	19	10, 15	> 44	≤ 3
NS_09	6.6.3.3.4	21	10, 15	> 40	≤ 1
				> 55	≤ 2
NS_10		20	15, 20	Table 6.2.4-3	
NS_11	6.6.2.2.1	23	1.4, 3, 5, 10, 15, 20	Table 6.2.4-5	
NS_12	6.6.3.3.5	26	1.4, 3, 5	Table 6.2.4-6	
NS_13	6.6.3.3.6	26	5	Table 6.2.4-7	
NS_14	6.6.3.3.7	26	10, 15	Table 6.2.4-8	
NS_15	6.6.3.3.8	26	1.4, 3, 5, 10, 15	Table 6.2.4-9 Table 6.2.4-10	
NS_16	6.6.3.3.9	27	3, 5, 10	Table 6.2.4-11, Table 6.2.4-12, Table 6.2.4-13	
NS_17	6.6.3.3.10	28	5, 10	Table 5.6-1	N/A
NS_18	6.6.3.3.11	28	5	≥ 2	≤ 1
			10, 15, 20	≥ 1	≤ 4
NS_19	6.6.3.3.12	44	10, 15, 20	Table 6.2.4-14	
NS_20	6.2.2 6.6.2.2.1 6.6.3.2	23	5, 10, 15, 20	Table 6.2.4-15	
...					
NS_32	-	-	-	-	-

TDD-LTE

P TS 36.211 section 4.2 for Type 2 Frame Structure and Table 4.2-2 for uplink-downlink configurations and Table 4.2-1 for Special subframe configurations.

Table 4.2-1: Configuration of special subframe (lengths of DwPTS/GP/UpPTS).

Special subframe configuration	Normal cyclic prefix in downlink			Extended cyclic prefix in downlink		
	DwPTS	UpPTS		DwPTS	UpPTS	
		Normal cyclic prefix in uplink	Extended cyclic prefix in uplink		Normal cyclic prefix in uplink	Extended cyclic prefix in uplink
0	$6592 \cdot T_s$	$2192 \cdot T_s$	$2560 \cdot T_s$	$7680 \cdot T_s$	$2192 \cdot T_s$	$2560 \cdot T_s$
1	$19760 \cdot T_s$			$20480 \cdot T_s$		
2	$21952 \cdot T_s$			$23040 \cdot T_s$		
3	$24144 \cdot T_s$			$25600 \cdot T_s$		
4	$26336 \cdot T_s$			$7680 \cdot T_s$	$4384 \cdot T_s$	$5120 \cdot T_s$
5	$6592 \cdot T_s$	$4384 \cdot T_s$	$5120 \cdot T_s$	$20480 \cdot T_s$		
6	$19760 \cdot T_s$			$23040 \cdot T_s$		
7	$21952 \cdot T_s$			$12800 \cdot T_s$		
8	$24144 \cdot T_s$			-	-	-
9	$13168 \cdot T_s$			-	-	-

Table 4.2-2: Uplink-downlink configurations.

Uplink-downlink configuration	Downlink-to-Uplink Switch-point periodicity	Subframe number									
		0	1	2	3	4	5	6	7	8	9
0	5 ms	D	S	U	U	U	D	S	U	U	U
1	5 ms	D	S	U	U	D	D	S	U	U	D
2	5 ms	D	S	U	D	D	D	S	U	D	D
3	10 ms	D	S	U	U	U	D	D	D	D	D
4	10 ms	D	S	U	U	D	D	D	D	D	D
5	10 ms	D	S	U	D	D	D	D	D	D	D
6	5 ms	D	S	U	U	U	D	S	U	U	D

Calculated Duty Cycle

Uplink-Downlink Configuration	Downlink-to-Uplink Switch-point Periodicity	Subframe Number										Calculated Duty Cycle (%)
		0	1	2	3	4	5	6	7	8	9	
0	5 ms	D	S	U	U	U	D	S	U	U	U	63.33
1	5 ms	D	S	U	U	D	D	S	U	U	D	43.33
2	5 ms	D	S	U	D	D	D	S	U	D	D	23.33
3	10 ms	D	S	U	U	U	D	D	D	D	D	31.67
4	10 ms	D	S	U	U	D	D	D	D	D	D	21.67
5	10 ms	D	S	U	D	D	D	D	D	D	D	11.67
6	5 ms	D	S	U	U	U	D	S	U	U	D	53.33

We used configuration 0 for LTE Band 41 SAR test, that is 63.33%(1:1.58)for duty cycle.

7.3 Maximum Target Output Power

Max Target Power(dBm)			
Mode/Band	Channel		
	Low	Middle	High
PCS 1900	29.5	29.5	29.5
GPRS 1 TX Slot	29.5	29.5	29.5
GPRS 2 TX Slot	28	28	28
GPRS 3 TX Slot	26	26	26
GPRS 4 TX Slot	25	25	25
EDGE 1 TX Slot	26.5	26.5	26.5
EDGE 2 TX Slot	23.5	23.5	23.5
EDGE 3 TX Slot	21.5	21.5	21.5
EDGE 4 TX Slot	21.5	21.5	21.5
WCDMA Band 4	21.5	21.5	21.5
HSDPA	20	20	20
HSUPA	20	20	20
DC-HSDPA	20	20	20
HSPA+	20	20	20
LTE Band 2(20M)	21	21	21
LTE Band 4(20M)	20.5	20.5	20.5
LTE Band 7(20M)	23	23	23
LTE Band 12(10M)	23.5	23.5	23.5
LTE Band 13(10M)	23.5	23.5	23.5
LTE Band 38(20M)	22.5	22.5	22.5
LTE Band 41(20M)	22.5	22.5	22.5
WLAN 2.4G(802.11b)	14	14	14
WLAN 2.4G(802.11g)	10	10	10
WLAN 2.4G(802.11n ht20)	10	10	10
WLAN 2.4G(802.11n ht40)	10	10	10
WLAN 5.2G(802.11a)	16.5	16.5	16.5
WLAN 5.2G(802.11n20)	17	17	17
WLAN 5.2G(802.11n40)	13.5	/	13.5
WLAN 5.2G(802.11ac20)	17	17	17
WLAN 5.2G(802.11ac40)	13.5	/	13.5
WLAN 5.2G(802.11ac80)	/	10.5	/
WLAN 5.8G(802.11a)	17.5	17	16
WLAN 5.8G(802.11n20)	17.5	17.5	16
WLAN 5.8G(802.11n40)	17.4	/	17.4
WLAN 5.8G(802.11ac20)	17.5	17.5	16
WLAN 5.8G(802.11ac40)	17.4	/	17.4
WLAN 5.8G(802.11ac80)	/	13.5	/
Bluetooth BDR/EDR	2.2	2.2	2.2
Bluetooth LE 1M	0	0	0
Bluetooth LE 2M	0	0	0

7.4 Test Results:

GSM:

Band	Channel No.	Frequency (MHz)	RF Output Power (dBm)
PCS 1900	512	1850.2	29.03
	661	1880	29.26
	810	1909.8	29.25

GPRS:

Band	Channel No.	Frequency (MHz)	RF Output Power (dBm)			
			1 slot	2 slots	3 slots	4 slots
PCS 1900	512	1850.2	28.27	27.51	25.64	24.57
	661	1880	29.04	27.52	25.63	24.33
	810	1909.8	28.53	27.71	25.95	24.34

EDGE:

Band	Channel No.	Frequency (MHz)	RF Output Power (dBm)			
			1 slot	2 slots	3 slots	4 slots
PCS 1900	512	1850.2	26.05	23.23	21.37	20.86
	661	1880	25.17	23.39	21.23	21.12
	810	1909.8	25.58	23.20	21.25	21.09

For SAR, the time based average power is relevant, the difference in between depends on the duty cycle of the TDMA signal.

Number of Time slot	1	2	3	4
Duty Cycle	1:8	1:4	1:2.66	1:2
Time based Ave. power compared to slotted Ave. power	-9 dB	-6 dB	-4.25 dB	-3 dB
Crest Factor	8	4	2.66	2

The time based average power for GPRS

Band	Channel No.	Frequency (MHz)	Time based average Power (dBm)			
			1 slot	2 slot	3 slots	4 slots
PCS 1900	512	1850.2	19.27	21.51	21.39	21.57
	661	1880	20.04	21.52	21.38	21.33
	810	1909.8	19.53	**21.71**	21.7	21.34

The time based average power for EDGE

Band	Channel No.	Frequency (MHz)	Time based average Power (dBm)			
			1 slot	2 slot	3 slots	4 slots
PCS 1900	512	1850.2	17.05	17.23	17.12	17.86
	661	1880	16.17	17.39	16.98	18.12
	810	1909.8	16.58	17.2	17	18.09

Note:

1. Agilent Technologies Communication Tester (8960) was used for the measurement of GSM peak and average output power for active timeslots.
2. .For GSM voice, 1 timeslot has been activated with power level 0 (1900 MHz band).
3. .For GPRS, 1, 2, 3 and 4 timeslots has been activated separately with power level 3(1900 MHz band).
4. According to KDB941225D01-SAR for EGPRS mode are not required when the source-based time-averaged output power for data mode is lower than that in the normal GPRS mode.

WCDMA:
Results (12.2kbps RMC)

Band	Frequency (MHz)	RF Output Power (dBm)
WCDMA Band 4	1712.4	21.19
	1732.6	21.17
	1752.6	21.08

Results (HSDPA)

Band	Frequency (MHz)	RF Output Power (dBm)			
		Subset 1	Subset 2	Subset 3	Subset 4
WCDMA Band 4	1712.4	18.65	19.18	19.05	18.97
	1732.6	18.84	18.97	19.10	19.40
	1752.6	18.56	18.99	19.29	19.00

Results (HSUPA)

Band	Frequency (MHz)	RF Output Power (dBm)				
		Subset 1	Subset 2	Subset 3	Subset 4	Subset 5
WCDMA Band 4	1712.4	18.45	19.41	19.01	18.93	19.08
	1732.6	18.51	19.38	19.40	19.17	19.20
	1752.6	19.00	19.16	19.01	19.09	19.15

Results (DC-HSDPA)

Band	Frequency (MHz)	RF Output Power (dBm)			
		Subset 1	Subset 2	Subset 3	Subset 4
WCDMA Band 4	1712.4	19.28	19.06	18.85	18.81
	1732.6	18.86	18.92	19.23	18.99
	1752.6	19.41	19.36	18.94	19.07

Results (HSPA+)

Band	Frequency (MHz)	RF Output Power (dBm)
WCDMA Band 4	1712.4	19.19
	1732.6	19.38
	1752.6	18.81

Note:

1. The default test configuration is to measure SAR with an established radio link between the EUT and a communication test set using a 12.2 kbps RMC (reference measurement Channel) Configured in Test Loop Model 1.

2. KDB 941225 D01-Body SAR is not required for HSDPA/HSUPA/DC-HSDPA/HSPA+ when the maximum average output of each RF channel is less than ¼ dB higher than measured 12.2kbps RMC or the maximum SAR for 12.2kbps RMC is < 75% of SAR limit.

LTE Band 2:

Test Bandwidth	Test Modulation	Resource Block & RB offset	Target MPR	Meas MPR	Low Channel (dBm)	Middle Channel (dBm)	High Channel (dBm)
1.4M	QPSK	RB1#0	0	0	20.51	20.69	20.78
		RB1#3	0	0	20.7	20.92	20.9
		RB1#5	0	0	20.56	20.85	20.69
		RB3#0	1	1	20.66	20.89	20.69
		RB3#3	1	1	20.65	20.82	20.66
		RB6#0	1	1	19.69	19.81	19.74
	16-QAM	RB1#0	1	1	19.57	19.73	19.68
		RB1#3	1	1	19.81	19.96	19.83
		RB1#5	2	2	19.62	19.88	19.7
		RB3#0	2	2	19.88	19.94	19.64
		RB3#3	2	2	19.69	19.92	19.62
		RB6#0	2	2	18.77	18.9	18.75
3M	QPSK	RB1#0	0	0	20.61	20.89	20.6
		RB1#8	0	0	20.69	20.76	20.67
		RB1#14	0	0	20.65	20.9	20.61
		RB6#0	1	1	19.6	19.82	19.8
		RB6#9	1	1	19.59	19.82	19.7
		RB15#0	1	1	19.63	19.93	19.69
	16-QAM	RB1#0	1	1	19.89	20.01	20.38
		RB1#8	1	1	19.83	19.81	20.4
		RB1#14	1	1	19.74	19.92	20.2
		RB6#0	2	2	18.63	18.8	18.77
		RB6#9	2	2	18.71	18.79	18.73
		RB15#0	2	2	18.61	19.03	18.83
5M	QPSK	RB1#0	0	0	20.45	20.8	20.6
		RB1#13	0	0	20.63	20.86	20.76
		RB1#24	0	0	20.44	20.65	20.67
		RB15#0	1	1	19.58	19.69	19.82
		RB15#10	1	1	19.54	19.83	19.54
		RB25#0	1	1	19.55	19.69	19.62
	16-QAM	RB1#0	1	1	19.39	19.93	19.74
		RB1#13	1	1	19.48	20.17	19.75
		RB1#24	1	1	19.32	19.86	19.61
		RB15#0	2	2	18.62	18.78	18.75
		RB15#10	2	2	18.59	18.81	18.83
		RB25#0	2	2	18.65	18.92	18.79

Test Bandwidth	Test Modulation	Resource Block & RB offset	Target MPR	Meas MPR	Low Channel (dBm)	Middle Channel (dBm)	High Channel (dBm)
10M	QPSK	RB1#0	0	0	19.73	19.7	19.49
		RB1#25	0	0	19.99	19.84	19.79
		RB1#49	1	1	19.83	19.59	19.42
		RB25#0	1	1	19.01	18.7	18.63
		RB25#25	1	1	18.87	18.62	18.6
		RB50#0	1	1	18.9	18.69	18.69
	16-QAM	RB1#0	1	1	19.48	18.82	18.48
		RB1#25	1	1	19.57	18.92	18.8
		RB1#49	1	1	20.11	19.89	19.68
		RB25#0	2	2	18.88	18.98	18.97
		RB25#25	2	2	18.69	18.93	18.83
		RB50#0	2	2	18.76	18.83	18.9
15M	QPSK	RB1#0	0	0	20.28	20.57	20.39
		RB1#38	0	0	20.41	20.76	20.73
		RB1#74	1	1	20.25	20.6	20.43
		RB36#0	1	1	19.59	19.71	19.68
		RB36#39	1	1	19.51	19.79	19.67
		RB75#0	1	1	19.51	19.71	19.67
	16-QAM	RB1#0	1	1	19.96	19.79	19.91
		RB1#38	1	1	20.12	19.98	20.11
		RB1#74	2	2	19.82	19.55	19.85
		RB36#0	2	2	18.62	18.77	18.66
		RB36#39	2	2	18.62	18.72	18.67
		RB75#0	2	2	18.48	18.77	18.7
20M	QPSK	RB1#0	0	0	20.31	20.52	20.3
		RB1#50	0	0	20.75	20.86	20.9
		RB1#99	0	0	20.08	20.26	20.25
		RB50#0	1	1	20.57	20.91	20.62
		RB50#50	1	1	19.47	19.76	19.69
		RB100#0	1	1	19.68	20.75	19.58
	16-QAM	RB1#0	1	1	19.65	19.8	19.77
		RB1#50	1	1	19.99	20.36	20.49
		RB1#99	2	2	19.44	19.52	19.9
		RB50#0	2	2	19.55	19.77	19.65
		RB50#50	2	2	19.45	19.69	19.62
		RB100#0	2	2	19.55	19.75	19.69

LTE Band 4:

Test Bandwidth	Test Modulation	Resource Block & RB offset	Target MPR	Meas MPR	Low Channel (dBm)	Middle Channel (dBm)	High Channel (dBm)
1.4M	QPSK	RB1#0	0	0	20.12	19.84	19.8
		RB1#3	0	0	20.37	20.02	20.08
		RB1#5	0	0	20.17	19.82	19.75
		RB3#0	1	1	20.22	19.8	19.89
		RB3#3	1	1	20.2	19.86	19.9
		RB6#0	1	1	19.12	18.85	18.94
	16-QAM	RB1#0	1	1	19.2	18.91	18.85
		RB1#3	1	1	19.4	19.21	19.02
		RB1#5	2	2	19.23	18.88	18.86
		RB3#0	2	2	19.37	18.85	19.02
		RB3#3	2	2	19.31	18.81	18.87
		RB6#0	2	2	18.36	17.94	17.76
3M	QPSK	RB1#0	0	0	20.25	20.05	19.89
		RB1#8	0	0	20.22	20	19.91
		RB1#14	0	0	20.13	19.92	19.83
		RB6#0	1	1	19.28	18.81	18.97
		RB6#9	1	1	19.21	18.95	18.93
		RB15#0	1	1	19.28	18.9	18.86
	16-QAM	RB1#0	1	1	19.84	19.17	18.93
		RB1#8	1	1	19.84	19.01	19.03
		RB1#14	1	1	19.72	19.07	18.86
		RB6#0	2	2	18.42	18.05	17.86
		RB6#9	2	2	18.3	17.95	17.85
		RB15#0	2	2	18.4	17.92	17.9
5M	QPSK	RB1#0	0	0	20.21	19.85	19.78
		RB1#13	0	0	20.23	19.95	19.91
		RB1#24	0	0	20.01	19.74	19.76
		RB15#0	1	1	19.23	18.97	18.86
		RB15#10	1	1	19.09	18.88	18.84
		RB25#0	1	1	19.12	18.9	18.8
	16-QAM	RB1#0	1	1	19.03	19.12	18.89
		RB1#13	1	1	19.09	19.24	18.95
		RB1#24	1	1	18.89	18.98	18.82
		RB15#0	2	2	18.26	17.93	17.93
		RB15#10	2	2	18.17	17.8	17.87
		RB25#0	2	2	18.25	17.82	17.91

Test Bandwidth	Test Modulation	Resource Block & RB offset	Target MPR	Meas MPR	Low Channel (dBm)	Middle Channel (dBm)	High Channel (dBm)
10M	QPSK	RB1#0	0	0	20.21	19.82	19.79
		RB1#25	0	0	20.3	20.12	19.98
		RB1#49	1	1	20	19.81	19.85
		RB25#0	1	1	19.19	19	18.99
		RB25#25	1	1	19.19	18.92	19.01
		RB50#0	1	1	19.15	18.78	18.97
	16-QAM	RB1#0	1	1	19.21	19.49	19.04
		RB1#25	1	1	19.23	19.59	19.18
		RB1#49	1	1	18.95	19.28	18.93
		RB25#0	2	2	18.36	18.1	17.99
		RB25#25	2	2	18.25	18.01	17.98
		RB50#0	2	2	18.21	17.85	18.04
15M	QPSK	RB1#0	0	0	19.92	19.65	19.2
		RB1#38	0	0	19.94	19.95	19.73
		RB1#74	1	1	19.71	19.46	19.49
		RB36#0	1	1	19.06	18.88	18.71
		RB36#39	1	1	18.97	18.71	18.88
		RB75#0	1	1	19.01	18.75	18.65
	16-QAM	RB1#0	1	1	19.69	18.92	18.91
		RB1#38	1	1	19.69	19.05	19.38
		RB1#74	2	2	19.4	18.61	19.15
		RB36#0	2	2	18.07	17.96	17.61
		RB36#39	2	2	18.1	17.85	17.91
		RB75#0	2	2	18.18	17.83	17.85
20M	QPSK	RB1#0	0	0	19.76	19.67	19.54
		RB1#50	0	0	20.22	20.18	20.04
		RB1#99	0	0	19.49	19.09	19.54
		RB50#0	1	1	20.1	20.24	19.7
		RB50#50	1	1	19.03	18.71	18.97
		RB100#0	1	1	19.89	20.22	19.87
	16-QAM	RB1#0	1	1	19.11	18.84	18.97
		RB1#50	1	1	19.45	19.22	19.42
		RB1#99	2	2	18.88	18.97	19.07
		RB50#0	2	2	18.75	18.82	18.77
		RB50#50	2	2	18.63	18.72	18.87
		RB100#0	2	2	18.68	18.9	18.78

LTE Band 7:

Test Bandwidth	Test Modulation	Resource Block & RB offset	Target MPR	Meas MPR	Low Channel (dBm)	Middle Channel (dBm)	High Channel (dBm)
5M	QPSK	RB1#0	0	0	22	22.36	22.38
		RB1#13	0	0	22.38	22.42	22.6
		RB1#24	0	0	22.25	22.22	22.35
		RB15#0	1	1	21.18	21.38	21.61
		RB15#10	1	1	21.36	21.45	21.56
		RB25#0	1	1	21.19	21.22	21.43
	16-QAM	RB1#0	1	1	21.12	21.49	21.26
		RB1#13	1	1	21.27	21.66	21.42
		RB1#24	1	1	21.03	21.55	21.39
		RB15#0	2	2	20.21	20.38	20.66
		RB15#10	2	2	20.3	20.25	20.61
		RB25#0	2	2	20.3	20.37	20.57
10M	QPSK	RB1#0	0	0	22.75	22.38	22.5
		RB1#25	0	0	22.92	22.57	22.68
		RB1#49	0	0	22.77	22.23	22.41
		RB25#0	1	1	21.87	21.45	21.52
		RB25#25	1	1	21.9	21.51	21.59
		RB50#0	1	1	21.91	21.86	21.65
	16-QAM	RB1#0	1	1	21.6	21.86	21.56
		RB1#25	1	1	21.66	22.19	21.85
		RB1#49	1	1	21.43	21.83	21.67
		RB25#0	2	2	20.9	20.8	20.73
		RB25#25	2	2	20.73	20.63	20.65
		RB50#0	2	2	20.68	20.79	20.53
15M	QPSK	RB1#0	0	0	22.6	22.81	22.3
		RB1#38	0	0	22.88	22.59	22.51
		RB1#74	0	0	22.68	22.29	22.43
		RB36#0	1	1	21.94	21.84	21.67
		RB36#39	1	1	21.81	21.91	21.61
		RB75#0	1	1	21.94	21.84	21.68
	16-QAM	RB1#0	1	1	21.87	21.77	21.87
		RB1#38	1	1	21.96	21.69	22.07
		RB1#74	1	1	21.77	21.69	21.99
		RB36#0	2	2	20.83	20.87	20.64
		RB36#39	2	2	20.88	20.88	20.6
		RB75#0	2	2	20.82	20.82	20.55

Test Bandwidth	Test Modulation	Resource Block & RB offset	Target MPR	Meas MPR	Low Channel (dBm)	Middle Channel (dBm)	High Channel (dBm)
20M	QPSK	RB1#0	0	0	22.49	22.09	22.32
		RB1#50	0	0	22.98	22.5	22.6
		RB1#99	0	0	22.38	22.1	22.23
		RB50#0	1	1	21.86	22.98	22.03
		RB50#50	1	1	22.46	22.3	22.52
		RB100#0	1	1	22.77	22.36	22.52
	16-QAM	RB1#0	1	1	21.54	21.59	21.72
		RB1#50	1	1	22.18	21.84	22.18
		RB1#99	1	1	21.7	21.34	21.8
		RB50#0	2	2	21.49	21.51	21.53
		RB50#50	2	2	21.49	21.33	21.42
		RB100#0	2	2	21.58	21.47	21.44

LTE Band 12:

Test Bandwidth	Test Modulation	Resource Block & RB offset	Target MPR	Meas MPR	Low Channel (dBm)	Middle Channel (dBm)	High Channel (dBm)
1.4M	QPSK	RB1#0	0	0	23.29	23.2	22.52
		RB1#3	0	0	23.48	23.32	22.68
		RB1#5	0	0	23.4	22.87	22.4
		RB3#0	1	1	23.36	22.81	22.44
		RB3#3	1	1	23.42	22.83	22.54
		RB6#0	1	1	22.37	21.96	21.51
	16-QAM	RB1#0	1	1	22.3	22	21.43
		RB1#3	1	1	22.39	21.84	21.64
		RB1#5	2	2	22.38	21.86	21.54
		RB3#0	2	2	22.5	21.83	21.65
		RB3#3	2	2	22.59	22.03	21.66
		RB6#0	2	2	21.42	21.05	20.67
3M	QPSK	RB1#0	0	0	23.46	22.65	22.55
		RB1#8	0	0	23.41	22.83	22.6
		RB1#14	0	0	23.34	22.69	22.63
		RB6#0	1	1	22.42	21.74	21.55
		RB6#9	1	1	22.31	21.81	21.51
		RB15#0	1	1	22.32	21.71	21.54
	16-QAM	RB1#0	1	1	22.08	21.7	22.17
		RB1#8	1	1	22	21.71	22.08
		RB1#14	1	1	22.16	21.88	22.03
		RB6#0	2	2	21.05	20.74	20.64
		RB6#9	2	2	21.18	20.82	20.58
		RB15#0	2	2	21.01	21.05	20.65
5M	QPSK	RB1#0	0	0	23.23	23.13	22.59
		RB1#13	0	0	23.35	23.02	22.61
		RB1#24	0	0	23.16	22.69	22.39
		RB15#0	1	1	22.3	22.8	21.69
		RB15#10	1	1	22.26	21.61	21.56
		RB25#0	1	1	22.24	21.63	21.62
	16-QAM	RB1#0	1	1	22.13	21.83	21.85
		RB1#13	1	1	22.18	22.03	21.67
		RB1#24	1	1	21.92	22.06	21.34
		RB15#0	2	2	21.42	20.96	20.56
		RB15#10	2	2	21.26	20.71	20.61
		RB25#0	2	2	21.32	20.67	20.68

Test Bandwidth	Test Modulation	Resource Block & RB offset	Target MPR	Meas MPR	Low Channel (dBm)	Middle Channel (dBm)	High Channel (dBm)
10M	QPSK	RB1#0	0	0	23.41	23.22	22.52
		RB1#25	0	0	23.3	23.08	22.94
		RB1#49	1	1	23.21	22.6	22.41
		RB25#0	1	1	22.29	22.86	22.35
		RB25#25	1	1	21.99	21.6	21.71
		RB50#0	1	1	22.26	21.63	21.76
	16-QAM	RB1#0	1	1	22.84	21.77	21.88
		RB1#25	1	1	23.04	21.99	22.11
		RB1#49	1	1	22.75	21.76	22.43
		RB25#0	2	2	22.33	21.93	21.82
		RB25#25	2	2	22.2	21.74	21.78
		RB50#0	2	2	22.28	21.63	21.78

LTE Band 13:

Test Bandwidth	Test Modulation	Resource Block & RB offset	Target MPR	Meas MPR	Low Channel (dBm)	Middle Channel (dBm)	High Channel (dBm)
5M	QPSK	RB1#0	0	0	21.74	21.68	21.81
		RB1#13	0	0	21.92	21.86	21.92
		RB1#24	0	0	21.7	21.93	21.68
		RB15#0	1	1	20.77	20.93	20.95
		RB15#10	1	1	20.82	20.94	20.89
		RB25#0	1	1	20.84	20.88	20.82
	16-QAM	RB1#0	1	1	20.59	21.19	20.99
		RB1#13	1	1	22.19	22.57	22.28
		RB1#24	1	1	21.98	22.52	22.03
		RB15#0	2	2	21.19	21.28	21.33
		RB15#10	2	2	21.22	21.11	21.29
		RB25#0	2	2	21.2	21.3	21.25
10M	QPSK	RB1#0	0	0	/	22.86	/
		RB1#25	0	0	/	23.32	/
		RB1#49	1	1	/	23.25	/
		RB25#0	1	1	/	22.79	/
		RB25#25	1	1	/	22.58	/
		RB50#0	1	1	/	22.82	/
	16-QAM	RB1#0	1	1	/	22.67	/
		RB1#25	1	1	/	22.59	/
		RB1#49	1	1	/	22.46	/
		RB25#0	2	2	/	22.42	/
		RB25#25	2	2	/	22.13	/
		RB50#0	2	2	/	22.08	/

LTE Band 38:

Test Bandwidth	Test Modulation	Resource Block & RB offset	Target MPR	Meas MPR	Low Channel (dBm)	Middle Channel (dBm)	High Channel (dBm)
5M	QPSK	RB1#0	0	0	22.02	21.29	21.68
		RB1#13	0	0	21.78	21.56	21.7
		RB1#24	0	0	21.46	21.29	21.59
		RB15#0	1	1	20.95	20.43	20.87
		RB15#10	1	1	20.73	20.32	20.64
		RB25#0	1	1	20.85	20.36	20.66
	16-QAM	RB1#0	1	1	21.13	20.63	20.7
		RB1#13	1	1	20.94	20.81	20.79
		RB1#24	1	1	20.72	20.68	20.63
		RB15#0	2	2	20.12	19.54	19.68
		RB15#10	2	2	19.89	19.39	19.62
		RB25#0	2	2	20.02	19.36	19.67
10M	QPSK	RB1#0	0	0	21.96	21.47	21.73
		RB1#25	0	0	22	21.7	22.14
		RB1#49	0	0	21.58	21.35	21.73
		RB25#0	1	1	20.92	20.59	20.8
		RB25#25	1	1	20.62	20.55	20.82
		RB50#0	1	1	20.9	20.46	20.69
	16-QAM	RB1#0	1	1	21.5	20.47	20.84
		RB1#25	1	1	21.4	20.72	21.23
		RB1#49	1	1	20.91	20.35	20.9
		RB25#0	2	2	20	19.64	19.88
		RB25#25	2	2	19.68	19.46	19.79
		RB50#0	2	2	19.98	19.64	19.78
15M	QPSK	RB1#0	0	0	21.96	21.45	21.02
		RB1#38	0	0	21.66	21.44	21.76
		RB1#74	0	0	21.49	21.32	21.57
		RB36#0	1	1	20.81	20.56	20.67
		RB36#39	1	1	20.65	20.36	20.69
		RB75#0	1	1	20.81	20.42	20.67
	16-QAM	RB1#0	1	1	21.22	20.73	19.98
		RB1#38	1	1	20.9	20.68	20.8
		RB1#74	1	1	20.73	20.52	20.44
		RB36#0	2	2	19.77	19.51	19.58
		RB36#39	2	2	19.64	19.36	19.54
		RB75#0	2	2	19.67	19.46	19.62

Test Bandwidth	Test Modulation	Resource Block & RB offset	Target MPR	Meas MPR	Low Channel (dBm)	Middle Channel (dBm)	High Channel (dBm)
20M	QPSK	RB1#0	0	0	21.7	21.37	21.34
		RB1#50	0	0	21.93	21.63	22.03
		RB1#99	0	0	21.2	21.03	21.35
		RB50#0	1	1	20.92	20.7	20.52
		RB50#50	1	1	20.68	20.92	20.64
		RB100#0	1	1	20.78	20.5	20.66
	16-QAM	RB1#0	1	1	20.88	20.82	20.56
		RB1#50	1	1	20.96	20.95	21.21
		RB1#99	1	1	21.3	20.67	20.72
		RB50#0	2	2	20.88	20.77	20.68
		RB50#50	2	2	20.65	20.57	20.74
		RB100#0	2	2	20.76	20.61	20.72

LTE Band 41:

Test Bandwidth	Test Modulation	Resource Block & RB offset	Target MPR	Meas MPR	Low Channel (dBm)	2550MHz (dBm)	Middle Channel (dBm)	2620MHz (dBm)	High Channel (dBm)
5M	QPSK	RB1#0	0	0	21.54	21.24	21.28	21.97	21.96
		RB1#13	0	0	21.92	21.55	21.41	22.17	22.21
		RB1#24	0	0	21.77	21.17	21.17	22	22.04
		RB15#0	1	1	20.49	20.26	20.28	21.02	21.06
		RB15#10	1	1	20.99	20.35	20.31	21.09	21.04
		RB25#0	1	1	20.73	20.41	20.37	21.12	21.04
	16-QAM	RB1#0	1	1	21.06	20.69	20.64	21.04	21.02
		RB1#13	1	1	21.14	20.7	20.72	21.3	21.22
		RB1#24	1	1	21.05	20.69	20.57	21.13	21.14
		RB15#0	2	2	19.72	19.59	19.46	20.3	20.2
		RB15#10	2	2	20.1	19.45	19.47	20.15	20.02
		RB25#0	2	2	19.8	19.47	19.33	20.2	20.14
10M	QPSK	RB1#0	0	0	21.72	21.36	21.29	21.98	22
		RB1#25	0	0	22.14	21.86	21.8	22.34	22.43
		RB1#49	0	0	21.79	21.28	21.32	22.13	22.1
		RB25#0	1	1	20.53	20.73	20.59	21.43	21.33
		RB25#25	1	1	21.01	20.48	20.52	21.13	21.13
		RB50#0	1	1	20.87	20.66	20.53	21.27	21.27
	16-QAM	RB1#0	1	1	20.79	20.72	20.6	21.06	21.08
		RB1#25	1	1	21.27	21.15	21	21.39	21.39
		RB1#49	1	1	20.87	20.6	20.55	21.06	21.04
		RB25#0	2	2	19.51	19.66	19.6	20.42	20.42
		RB25#25	2	2	20.06	19.52	19.45	20.19	20.14
		RB50#0	2	2	19.84	19.57	19.49	20.3	20.28
15M	QPSK	RB1#0	0	0	21.57	21.33	21.26	21.84	21.83
		RB1#38	0	0	21.75	21.51	21.48	22.03	22
		RB1#74	0	0	21.41	21.11	21.15	21.84	21.88
		RB36#0	1	1	20.62	20.46	20.33	21.19	21.18
		RB36#39	1	1	20.7	20.49	20.39	20.99	20.92
		RB75#0	1	1	20.73	20.39	20.37	21.21	21.08
	16-QAM	RB1#0	1	1	20.95	20.57	20.47	21.13	21.1
		RB1#38	1	1	21.05	20.72	20.6	21.44	21.3
		RB1#74	1	1	20.62	20.67	20.54	21.17	21.21
		RB36#0	2	2	19.57	19.53	19.43	20.17	20.09
		RB36#39	2	2	19.85	19.35	19.32	19.89	19.86
		RB75#0	2	2	19.74	19.31	19.22	19.89	19.91

Test Bandwidth	Test Modulation	Resource Block & RB offset	Target MPR	Meas MPR	Low Channel (dBm)	2550MHz (dBm)	Middle Channel (dBm)	2620MHz (dBm)	High Channel (dBm)
20M	QPSK	RB1#0	0	0	21.4	21.49	21.28	21.7	21.6
		RB1#50	0	0	22.43	22.38	22.49	22.26	22.23
		RB1#99	0	0	21.14	21.28	21.22	21.81	21.71
		RB50#0	1	1	21.42	21.47	22.19	21.37	21.27
		RB50#50	1	1	20.84	20.87	20.91	20.81	20.85
		RB100#0	1	1	20.56	20.63	22.16	21.1	21.07
	16-QAM	RB1#0	1	1	20.57	20.66	20.86	20.82	20.77
		RB1#50	1	1	20.92	21.05	20.97	21.39	21.28
		RB1#99	1	1	20.89	21.23	20.96	20.77	20.73
		RB50#0	2	2	20.79	20.61	20.57	20.64	20.75
		RB50#50	2	2	20.86	20.51	20.69	20.69	20.92
		RB100#0	2	2	20.75	20.57	20.52	20.63	20.64

WLAN 2.4G:

Mode	Channel frequency (MHz)	Data Rate	Duty Cycle (%)	Conducted Average Output Power(dBm)
802.11b	2412	1Mbps	100	13.58
	2442			13.55
	2472			**13.88**
802.11g	2412	6Mbps	100	9.51
	2442			8.89
	2472			9.51
802.11n ht20	2412	MCS0	100	9.26
	2442			9.05
	2472			9.28
802.11n ht40	2422	MCS0	100	9.61
	2442			9.09
	2462			9.49

Note: The test plots of duty cycle, please refer to the radio report: 2401T35202E-RFB, which was issued by Bay Area Compliance Laboratories Corp. (Shenzhen).

WLAN 5.2G:

Mode	Channel frequency (MHz)	Data Rate	Duty Cycle (%)	Conducted Average Output Power(dBm)
802.11a	5180	6Mbps	100	16.26
	5200			16.15
	5240			15.92
802.11n20	5180	MCS0	100	16.15
	5200			16.27
	5240			15.92
802.11n40	5190	MCS0	100	13.04
	5230			13.15
802.11ac20	5180	MCS0	100	**16.68**
	5200			16.5
	5240			16.12
802.11ac40	5190	MCS0	100	13.15
	5230			13.39
802.11ac80	5210	MCS0	100	10.38

Note: The test plots of duty cycle, please refer to the radio report: 2401T35202E-RF-00B, which was issued by Bay Area Compliance Laboratories Corp. (Shenzhen).

WLAN 5.8G:

Mode	Channel frequency (MHz)	Data Rate	Duty Cycle (%)	Conducted Average Output Power(dBm)
802.11a	5745	6Mbps	100	17.27
	5785			16.94
	5825			15.89
802.11n20	5745	MCS0	100	17.21
	5785			17.01
	5825			15.64
802.11n40	5755	MCS0	100	17.09
	5795			16.42
802.11ac20	5745	MCS0	100	**17.32**
	5785			17.27
	5825			15.83
802.11ac40	5755	MCS0	100	17.19
	5795			16.68
802.11ac80	5775	MCS0	100	13.38

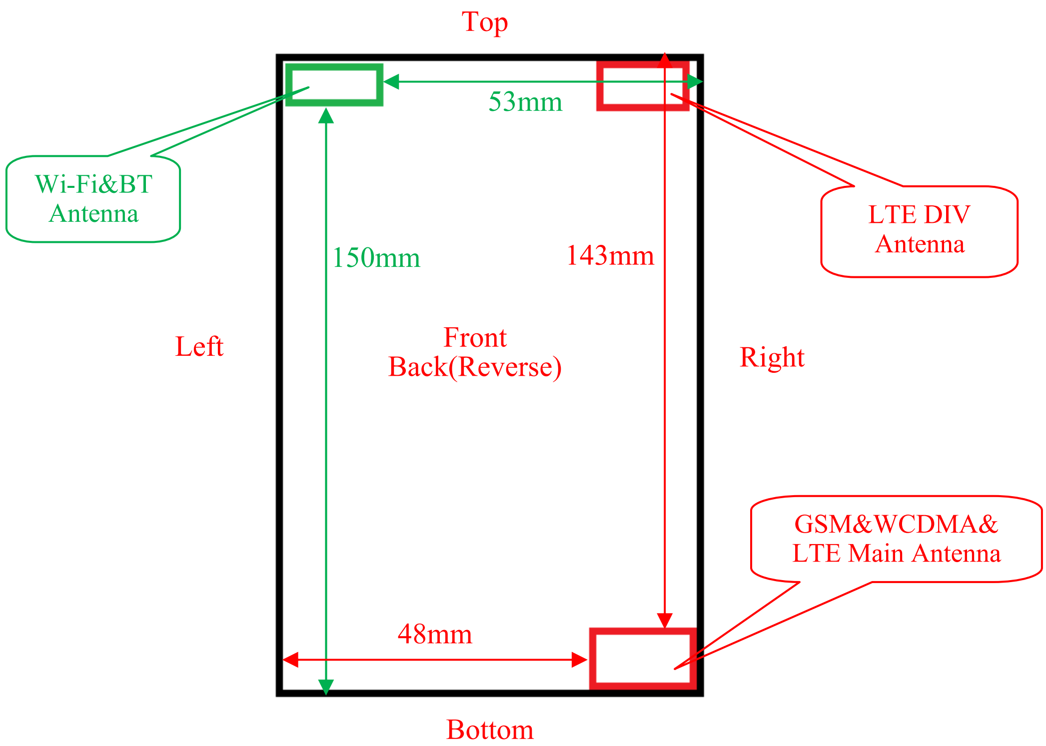
Note: The test plots of duty cycle, please refer to the radio report: 2401T35202E-RF-00B, which was issued by Bay Area Compliance Laboratories Corp. (Shenzhen).

Bluetooth:

Mode	Channel frequency (MHz)	RF Output Power (dBm)
BDR(GFSK)	2402	2.07
	2441	2.03
	2480	2.11
EDR(π/4-DQPSK)	2402	1.43
	2441	1.37
	2480	1.52
EDR(8DPSK)	2402	1.47
	2441	1.39
	2480	1.65
BLE 1M	2402	-0.96
	2440	-1.12
	2480	-0.73
BLE 2M	2402	-0.83
	2440	-1.11
	2480	-0.88

8. STANDALONE SAR TEST EXCLUSION CONSIDERATIONS

8.1 Antennas Location:



Note: The LTE DIV antenna can not transmit, and is receiving only.

8.2 Antenna Distance To Edge

Antenna Distance To Edge(mm)						
Antenna	**Back**	**Front**	**Left**	**Right**	**Top**	**Bottom**
WWAN Antenna(GSM/WCDMA/LTE)	< 5	< 5	48	< 5	143	< 5
WLAN/BT Antenna	< 5	< 5	< 5	53	< 5	150

8.3 Standalone SAR test exclusion considerations

Mode	Frequency (MHz)	Output Power (dBm)	Output Power (mW)	Distance (mm)	Calculated value	Threshold (1-g)	SAR Test Exclusion
WLAN 2.4G	2472	14	25.1	0	7.9	3	NO
WLAN 5.2G	5240	17	50.1	0	22.9	3	NO
WLAN 5.8G	5825	17.5	56.2	0	27.1	3	NO
Bluetooth	2480	2.2	1.7	0	0.5	3	YES

Note: *The WLAN based average power for calculation. and bluetooth based peak output power for calculation.*

NOTE:
The 1-g and 10-g SAR test exclusion thresholds for 100 MHz to 6 GHz at test separation distances ≤ 50 mm are determined by:
[(max. power of channel, including tune-up tolerance, mW)/(min. test separation distance, mm)] · [√f(GHz)] ≤ 3.0 for 1-g SAR and ≤7.5 for 10-g extremity SAR, where
1. f(GHz) is the RF channel transmit frequency in GHz.
2. Power and distance are rounded to the nearest mW and mm before calculation.
3. The result is rounded to one decimal place for comparison.

4. When the minimum test separation distance is < 5 mm, a distance of 5 mm is applied to determine SAR test Exclusion.

According to KDB447498 D01 General RF Exposure Guidance v06: 4.3. General SAR test exclusion guidance c) For frequencies below 100 MHz, the following may be considered for SAR test exclusion (also illustrated in Appendix C):

1) For *test separation distances* > 50 mm and < 200 mm, the power threshold at the corresponding test separation distance at 100 MHz in step b) is multiplied by [1 + log(100/f(MHz))]

2) For *test separation distances* ≤ 50 mm, the power threshold determined by the equation in c) 1) for 50 mm and 100 MHz is multiplied by ½

3) SAR measurement procedures are not established below 100 MHz

Measurement Result:
For NFC, the power of EUT: E Field@3m is 73.63dBuV/m =-21.57dBm (0.007mW)
Note: E[dBμV/m] = EIRP[dBm] + 95.2 for d = 3 m.
SAR test exclusion threshold for NFC(13.56MHz) separation distance < 50mm
=[474*(1 + log(100/f(MHz)))]/2
= 443mW
>0.007mW
Conclusion:
The NFC SAR evaluation can be exempted.

8.4 Standalone SAR estimation:

Mode	Frequency (MHz)	Output Power (dBm)	Output Power (mW)	Distance (mm)	Estimated 1-g (W/kg)
BT Head	2480	2.2	1.7	0	0.07
BT Body	2480	2.2	1.7	10	0.04

Note: *The bluetooth based peak power for calculation.*

When standalone SAR test exclusion applies to an antenna that transmits simultaneously with other antennas, the standalone SAR must be estimated according to following to determine simultaneous transmission SAR test exclusion:
[(max. power of channel, including tune-up tolerance , mW)/(min. test separation distance,mm)] · [√f(GHz)/x]
W/kg for test separation distances ≤50 mm;
where x = 7.5 for 1-g SAR.
When the minimum test separation distance is < 5 mm, a distance of 5 mm is applied to determine SAR test Exclusion

8.5 SAR test exclusion for the EUT edge considerations Result

Mode	Back	Front	Left	Right	Top	Bottom
BT	Exclusion*	Exclusion*	Exclusion*	Exclusion*	Exclusion*	Exclusion*
WLAN	**Required**	**Required**	**Required**	Exclusion	**Required**	Exclusion
WWAN(GSM/WCDMA/LTE)	**Required**	**Required**	Exclusion	**Required**	Exclusion	**Required**

Note:

Required: The distance to Edge is less than 25mm, testing is required.
Exclusion*: SAR test exclusion evaluation has been done above.
Exclusion: The distance to Edge is more than 25 mm, testing is not required.

Extremity Exposure Considerations

Per KDB 648474 D04 D04v01r03, this device is considered a “Phablet” since the diagonal dimension is >160mm and < 200mm, when hotspot mode applies, extremity SAR is required only for the surfaces and edges with hotspot mode scaled to the maximum output power (with tolerance is 1g SAR > 1.2W/kg)

Extremity Exposure Condition		
Worst Mode	**Hotspot SAR value**	**Extremity Condition Test**
LTE Band 4	1.05	Exclusion

9. SAR MEASUREMENT RESULTS

This page summarizes the results of the performed dosimetric evaluation.

9.1 SAR Test Data

Environmental Conditions

Temperature:	21.5-22.1 ℃	21.7-22.3℃	22.2-22.9 ℃	22.4-23.2 ℃
Relative Humidity:	36 %	33%	40 %	52 %
ATM Pressure:	99.8 kPa	100.9 kPa	100.1 kPa	99.5 kPa
Test Date:	2024/08/03	2024/08/04	2024/08/05	2024/08/06

Testing was performed by Lily Yang, Petre Ma, Mark Dong.

PCS 1900:

EUT Position	Frequency (MHz)	Test Mode	Max. Meas. Power (dBm)	Max. Rated Power (dBm)	1g SAR (W/kg)			
					Scaled Factor	Meas. SAR	Scaled SAR	Plot
Head Cheek	1850.2	GSM	29.03	29.5	1.114	0.087	**0.10**	**1#**
	1880	GSM	29.26	29.5	1.057	0.074	0.08	/
	1909.8	GSM	29.25	29.5	1.059	0.077	0.08	/
Body Front (10mm)	1850.2	GPRS	/	/	/	/	/	/
	1880	GPRS	27.52	28	1.117	0.323	0.36	/
	1909.8	GPRS	/	/	/	/	/	/
Body Back (10mm)	1850.2	GPRS	27.51	28	1.119	0.590	**0.66**	**2#**
	1880	GPRS	27.52	28	1.117	0.451	0.50	/
	1909.8	GPRS	27.71	28	1.069	0.462	0.49	/
Body Right (10mm)	1850.2	GPRS	/	/	/	/	/	/
	1880	GPRS	27.52	28	1.117	0.206	0.23	/
	1909.8	GPRS	/	/	/	/	/	/
Body Bottom (10mm)	1850.2	GPRS	/	/	/	/	/	/
	1880	GPRS	27.52	28	1.117	0.351	0.39	/
	1909.8	GPRS	/	/	/	/	/	/

Note:

1. When the 1-g SAR is ≤ 0.8W/Kg, testing for other channels are optional.
2. The EUT transmit and receive through the same GSM antenna while testing SAR.
3. When SAR or MPE is not measured at the maximum power level allowed for production units, the results must be scaled to the maximum tune-up tolerance limit according to the power applied to the individual channels tested to determine compliance.
4. When the maximum output power variation across the required test channels is > 0.5 dB, instead of the middle channel, the highest output power channel must be used.
5. The Multi-slot Classes of EUT is Class 12 which has maximum 4 Downlink slots and 4 Uplink slots, the maximum active slots is 5, when perform the multiple slots scan, 3DL+2UL is the worst case.

WCDMA Band 4:

EUT Position	Frequency (MHz)	Test Mode	Max. Meas. Power (dBm)	Max. Rated Power (dBm)	1g SAR (W/kg)			
					Scaled Factor	Meas. SAR	Scaled SAR	Plot
Head Cheek	1712.4	RMC	21.19	21.5	1.074	0.170	0.18	/
	1732.6	RMC	21.17	21.5	1.079	0.297	**0.32**	**3#**
	1752.6	RMC	21.08	21.5	1.102	0.208	0.23	/
Body Front (10mm)	1712.4	RMC	21.19	21.5	1.074	0.478	0.51	/
	1732.6	RMC	21.17	21.5	1.079	0.662	**0.71**	**4#**
	1752.6	RMC	21.08	21.5	1.102	0.565	0.62	/
Body Back (10mm)	1712.4	RMC	/	/	/	/	/	/
	1732.6	RMC	21.17	21.5	1.079	0.473	0.51	/
	1752.6	RMC	/	/	/	/	/	/
Body Right (10mm)	1712.4	RMC	/	/	/	/	/	/
	1732.6	RMC	21.17	21.5	1.079	0.561	0.61	/
	1752.6	RMC	/	/	/	/	/	/
Body Bottom (10mm)	1712.4	RMC	/	/	/	/	/	/
	1732.6	RMC	21.17	21.5	1.079	0.406	0.44	/
	1752.6	RMC	/	/	/	/	/	/

Note:

1. When the 1-g SAR is≤ 0.8W/Kg, testing for other channels are optional.
2. The EUT transmit and receive through the same antenna while testing SAR.
3. The default test configuration is to measure SAR with an established radio link between the EUT and a communication test set using a 12.2 kbps RMC (reference measurement Channel) Configured in Test Loop Model.
4. KDB 941225 D01-Body SAR is not required for HSDPA/HSUPA/DC-HSDPA/HSPA+ when the maximum average output of each RF channel is less than ¼ dB higher than measured 12.2kbps RMC or the maximum SAR for 12.2kbps RMC is < 75% of SAR limit.
5. When SAR or MPE is not measured at the maximum power level allowed for production units, the results must be scaled to the maximum tune-up tolerance limit according to the power applied to the individual channels tested to determine compliance.

LTE Band 2:

EUT Position	Frequency (MHz)	Bandwidth (MHz)	Test Mode	Max. Meas. Power (dBm)	Max. Rated Power (dBm)	1g SAR (W/kg)			
						Scaled Factor	Meas. SAR	Scaled SAR	Plot
Head Cheek	1860	20	1RB	20.75	21	1.059	0.249	**0.26**	**5#**
	1880	20	1RB	20.86	21	1.033	0.072	0.07	/
	1900	20	1RB	20.9	21	1.023	0.188	0.19	/
	1880	20	50%RB	20.91	21	1.021	0.059	0.06	/
Body Front (10mm)	1860	20	1RB	/	/	/	/	/	/
	1880	20	1RB	20.86	21	1.033	0.539	0.56	/
	1900	20	1RB	/	/	/	/	/	/
	1880	20	50%RB	20.91	21	1.021	0.428	0.44	/
Body Back (10mm)	1860	20	1RB	/	/	/	/	/	/
	1880	20	1RB	20.86	21	1.033	0.633	0.65	/
	1900	20	1RB	/	/	/	/	/	/
	1880	20	50%RB	20.91	21	1.021	0.528	0.54	/
Body Right (10mm)	1860	20	1RB	/	/	/	/	/	/
	1880	20	1RB	20.86	21	1.033	0.242	0.25	/
	1900	20	1RB	/	/	/	/	/	/
	1880	20	50%RB	20.91	21	1.021	0.200	0.20	/
Body Bottom (10mm)	1860	20	1RB	20.75	21	1.059	0.910	**0.96**	**6#**
	1880	20	1RB	20.86	21	1.033	0.765	0.79	/
	1900	20	1RB	20.9	21	1.023	0.771	0.79	/
	1880	20	50%RB	20.91	21	1.021	0.662	0.68	/
	1880	20	100%RB	20.75	21	1.059	0.660	0.70	/

LTE Band 4:

EUT Position	Frequency (MHz)	Bandwidth (MHz)	Test Mode	Max. Meas. Power (dBm)	Max. Rated Power (dBm)	1g SAR (W/kg)			
						Scaled Factor	Meas. SAR	Scaled SAR	Plot
Head Cheek	1720	20	1RB	20.22	20.5	1.067	0.246	0.26	/
	1732.5	20	1RB	20.18	20.5	1.076	0.119	0.13	/
	1745	20	1RB	20.04	20.5	1.112	0.274	**0.30**	**7#**
	1732.5	20	50%RB	20.24	20.5	1.062	0.101	0.11	/
Body Front (10mm)	1720	20	1RB	/	/	/	/	/	/
	1732.5	20	1RB	20.18	20.5	1.076	0.732	0.79	/
	1745	20	1RB	/	/	/	/	/	/
	1732.5	20	50%RB	20.24	20.5	1.062	0.612	0.65	/
Body Back (10mm)	1720	20	1RB	20.22	20.5	1.067	0.714	0.76	/
	1732.5	20	1RB	20.18	20.5	1.076	0.819	0.88	/
	1745	20	1RB	20.04	20.5	1.112	0.890	0.99	/
	1732.5	20	50%RB	20.24	20.5	1.062	0.476	0.51	/
	1732.5	20	100%RB	20.22	20.5	1.067	0.730	0.78	/
Body Right (10mm)	1720	20	1RB	20.22	20.5	1.067	0.823	0.88	/
	1732.5	20	1RB	20.18	20.5	1.076	0.864	0.93	/
	1745	20	1RB	20.04	20.5	1.112	0.942	**1.05**	**8#**
	1732.5	20	50%RB	20.24	20.5	1.062	0.729	0.77	/
	1732.5	20	100%RB	20.22	20.5	1.067	0.768	0.82	/
Body Bottom (10mm)	1720	20	1RB	/	/	/	/	/	/
	1732.5	20	1RB	20.18	20.5	1.076	0.509	0.55	/
	1745	20	1RB	/	/	/	/	/	/
	1732.5	20	50%RB	20.24	20.5	1.062	0.422	0.45	/

LTE Band 7:

EUT Position	Frequency (MHz)	Bandwidth (MHz)	Test Mode	Max. Meas. Power (dBm)	Max. Rated Power (dBm)	1g SAR (W/kg)			
						Scaled Factor	Meas. SAR	Scaled SAR	Plot
Head Cheek	2510	20	1RB	22.98	23	1.005	0.085	**0.09**	**9#**
	2535	20	1RB	22.5	23	1.122	0.080	0.09	/
	2560	20	1RB	22.6	23	1.096	0.069	0.08	/
	2535	20	50%RB	22.98	23	1.005	0.063	0.06	/
Body Front (10mm)	2510	20	1RB	/	/	/	/	/	/
	2535	20	1RB	22.5	23	1.122	0.369	0.41	/
	2560	20	1RB	/	/	/	/	/	/
	2535	20	50%RB	22.98	23	1.005	0.173	0.17	/
Body Back (10mm)	2510	20	1RB	22.98	23	1.005	0.670	0.67	/
	2535	20	1RB	22.5	23	1.122	0.804	0.90	/
	2560	20	1RB	22.6	23	1.096	0.911	1.00	/
	2535	20	50%RB	22.98	23	1.005	0.695	0.70	/
	2560	20	100%RB	22.52	23	1.117	0.754	0.84	/
Body Right (10mm)	2510	20	1RB	/	/	/	/	/	/
	2535	20	1RB	22.5	23	1.122	0.162	0.18	/
	2560	20	1RB	/	/	/	/	/	/
	2535	20	50%RB	22.98	23	1.005	0.160	0.16	/
Body Bottom (10mm)	2510	20	1RB	22.98	23	1.005	0.625	0.63	/
	2535	20	1RB	22.5	23	1.122	0.770	0.86	/
	2560	20	1RB	22.6	23	1.096	0.950	**1.04**	**10#**
	2535	20	50%RB	22.98	23	1.005	0.791	0.79	/
	2560	20	100%RB	22.52	23	1.117	0.796	0.89	/

LTE Band 12:

EUT Position	Frequency (MHz)	Bandwidth (MHz)	Test Mode	Max. Meas. Power (dBm)	Max. Rated Power (dBm)	1g SAR (W/kg)			
						Scaled Factor	Meas. SAR	Scaled SAR	Plot
Head Cheek	704	10	1RB	23.41	23.5	1.021	0.229	0.23	/
	707.5	10	1RB	23.22	23.5	1.067	0.164	0.17	/
	711	10	1RB	22.94	23.5	1.138	0.241	**0.27**	**11#**
	707.5	10	50%RB	22.86	23.5	1.159	0.132	0.15	/
Body Front (10mm)	704	10	1RB	/	/	/	/	/	/
	707.5	10	1RB	23.22	23.5	1.067	0.328	0.35	/
	711	10	1RB	/	/	/	/	/	/
	707.5	10	50%RB	22.86	23.5	1.159	0.263	0.30	/
Body Back (10mm)	704	10	1RB	23.41	23.5	1.021	0.345	0.35	/
	707.5	10	1RB	23.22	23.5	1.067	0.396	**0.42**	**12#**
	711	10	1RB	22.94	23.5	1.138	0.330	0.38	/
	707.5	10	50%RB	22.86	23.5	1.159	0.333	0.39	/
Body Right (10mm)	704	10	1RB	/	/	/	/	/	/
	707.5	10	1RB	23.22	23.5	1.067	0.196	0.21	/
	711	10	1RB	/	/	/	/	/	/
	707.5	10	50%RB	22.86	23.5	1.159	0.154	0.18	/
Body Bottom (10mm)	704	10	1RB	/	/	/	/	/	/
	707.5	10	1RB	23.22	23.5	1.067	0.147	0.16	/
	711	10	1RB	/	/	/	/	/	/
	707.5	10	50%RB	22.86	23.5	1.159	0.122	0.14	/

LTE Band 13:

EUT Position	Frequency (MHz)	Bandwidth (MHz)	Test Mode	Max. Meas. Power (dBm)	Max. Rated Power (dBm)	1g SAR (W/kg)			
						Scaled Factor	Meas. SAR	Scaled SAR	Plot
Head Cheek	782	10	1RB	23.32	23.5	1.042	0.195	**0.20**	**13#**
	782	10	50%RB	22.79	23.5	1.178	0.155	0.18	/
Body Front (10mm)	782	10	1RB	23.32	23.5	1.042	0.404	0.42	/
	782	10	50%RB	22.79	23.5	1.178	0.322	0.38	/
Body Back (10mm)	782	10	1RB	23.32	23.5	1.042	0.477	**0.50**	**14#**
	782	10	50%RB	22.79	23.5	1.178	0.379	0.45	/
Body Right (10mm)	782	10	1RB	23.32	23.5	1.042	0.249	0.26	/
	782	10	50%RB	22.79	23.5	1.178	0.193	0.23	/
Body Bottom (10mm)	782	10	1RB	23.32	23.5	1.042	0.191	0.20	/
	782	10	50%RB	22.79	23.5	1.178	0.158	0.19	/

LTE Band 41&38:

EUT Position	Frequency (MHz)	Bandwidth (MHz)	Test Mode	Max. Meas. Power (dBm)	Max. Rated Power (dBm)	1g SAR (W/kg)			
						Scaled Factor	Meas. SAR	Scaled SAR	Plot
Head Cheek	2506	20	1RB	/	/	/	/	/	/
	2550	20	1RB	/	/	/	/	/	/
	2593	20	1RB	22.49	22.5	1.002	0.147	**0.15**	**15#**
	2620	20	1RB	/	/	/	/	/	/
	2680	20	1RB	/	/	/	/	/	/
	2593	20	50%RB	22.19	22.5	1.074	0.119	0.13	/
Body Front (10mm)	2506	20	1RB	/	/	/	/	/	/
	2550	20	1RB	/	/	/	/	/	/
	2593	20	1RB	22.49	22.5	1.002	0.318	0.32	/
	2620	20	1RB	/	/	/	/	/	/
	2680	20	1RB	/	/	/	/	/	/
	2593	20	50%RB	22.19	22.5	1.074	0.328	0.35	/
Body Back (10mm)	2506	20	1RB	/	/	/	/	/	/
	2550	20	1RB	/	/	/	/	/	/
	2593	20	1RB	22.49	22.5	1.002	0.518	0.52	/
	2620	20	1RB	/	/	/	/	/	/
	2680	20	1RB	/	/	/	/	/	/
	2593	20	50%RB	22.19	22.5	1.074	0.464	0.50	/
Body Right (10mm)	2506	20	1RB	/	/	/	/	/	/
	2550	20	1RB	/	/	/	/	/	/
	2593	20	1RB	22.49	22.5	1.002	0.053	0.05	/
	2620	20	1RB	/	/	/	/	/	/
	2680	20	1RB	/	/	/	/	/	/
	2593	20	50%RB	22.19	22.5	1.074	0.065	0.07	/
Body Bottom (10mm)	2506	20	1RB	/	/	/	/	/	/
	2550	20	1RB	/	/	/	/	/	/
	2593	20	1RB	22.49	22.5	1.002	0.800	**0.80**	**16#**
	2620	20	1RB	/	/	/	/	/	/
	2680	20	1RB	/	/	/	/	/	/
	2593	20	50%RB	22.19	22.5	1.074	0.665	0.71	/

Note:
1.The E-UTRA Operating Band 38 is a subset of band 41, and they are same in modulation type and rated output power, therefore, they were considered as one frequency band during SAR measurement, LTE Band 41 (the wide frequency range) was selected to test.

2.The frequency range of LTE Band 41 is 2496~ 2690MHz. Per KDB 447498 D01, according to the following formula Calculate Nc is 5.

KDB procedures, the following should be applied to determine the number of required test channels. The test channels should be evenly spread across the transmission frequency band of each wireless mode.[14]

$$N_c = Round\left\{\left[100\left(f_{high} - f_{low}\right)/f_c\right]^{0.5} \times \left(f_c/100\right)^{0.2}\right\},$$

where

- N_c is the number of test channels, rounded to the nearest integer,
- f_{high} and f_{low} are the highest and lowest channel frequencies within the transmission band,
- f_c is the mid-band channel frequency,
- all frequencies are in MHz.

3. The power class 3 used for LTE Band 41 SAR testing.

Note:

1. When the 1-g SAR is ≤ 0.8W/Kg, testing for other channels are optional.
2. SAR for LTE band exposure configurations is measured according to the procedures of KDB 941225 D05 SAR for LTE Devices v02.
3. KDB941225D05-SAR for higher order modulation is required only when the highest maximum output power for the configuration in the higher order modulation is > 0.5 dB higher than the same configuration in QPSK or when the reported SAR for the QPSK configuration is > 1.45 W/kg
4. KDB941225D05-For QPSK with 100% RB allocation, when the reported SAR measured for the Highest output power channel is <1.45 W/kg, tests for the remaining required test channels are optional.
5. KDB941225D05- For QPSK with 100% RB allocation, SAR is not required when the highest maximum output power for 100 % RB allocation is less than the highest maximum output power in 50% and 1 RB allocations and the highest reported SAR for 1 RB and 50% RB allocation are ≤ 0.8 W/kg.
6. KDB941225D05- Start with the largest channel bandwidth and measure SAR for QPSK with 1 RB allocation, using the RB offset and required test channel combination with the highest maximum output power among RB offset the upper edge, middle and lower edge of each required test channel.
7. KDB941225D05- other channel bandwidths SAR test is required when the highest maximum output power of a configuration requiring testing in the smaller channel bandwidth is > 0.5 dB higher than the equivalent channel configurations in the largest channel bandwidth configuration or the reported SAR of a configuration for the largest channel bandwidth is > 1.45 W/kg.
8. Worst case SAR for 50% RB allocation is selected to be tested.

WLAN 2.4G:

EUT Position	Frequency (MHz)	Test Mode	Max. Meas. Power (dBm)	Max. Rated Power (dBm)	1g SAR (W/kg)				
					Scaled Factor	Duty cycle Factor	Meas. SAR	Scaled SAR	Plot
Head Left Cheek	2412	802.11b	/	/	/	/	/	/	/
	2442	802.11b	13.55	14	1.109	1	0.094	0.10	/
	2472	802.11b	/	/	/	/	/	/	/
Head Left Tilt	2412	802.11b	/	/	/	/	/	/	/
	2442	802.11b	13.55	14	1.109	1	0.076	0.08	/
	2472	802.11b	/	/	/	/	/	/	/
Head Right Cheek	2412	802.11b	13.58	14	1.102	1	0.189	0.21	/
	2442	802.11b	13.55	14	1.109	1	0.175	0.19	/
	2472	802.11b	13.88	14	1.028	1	0.224	**0.23**	**17#**
Head Right Tilt	2412	802.11b	/	/	/	/	/	/	/
	2442	802.11b	13.55	14	1.109	1	0.158	0.18	/
	2472	802.11b	/	/	/	/	/	/	/
Body Front (10mm)	2412	802.11b	/	/	/	/	/	/	/
	2442	802.11b	13.55	14	1.109	1	0.030	0.03	/
	2472	802.11b	/	/	/	/	/	/	/
Body Back (10mm)	2412	802.11b	13.58	14	1.102	1	0.123	**0.14**	**18#**
	2442	802.11b	13.55	14	1.109	1	0.084	0.09	/
	2472	802.11b	13.88	14	1.028	1	0.106	0.11	/
Body Left (10mm)	2412	802.11b	/	/	/	/	/	/	/
	2442	802.11b	13.55	14	1.109	1	0.048	0.05	/
	2472	802.11b	/	/	/	/	/	/	/
Body Top (10mm)	2412	802.11b	/	/	/	/	/	/	/
	2442	802.11b	13.55	14	1.109	1	0.029	0.03	/
	2472	802.11b	/	/	/	/	/	/	/

Note:
1. When the 1-g SAR is≤ 0.8W/kg, testing for other channels are optional.
2. When SAR or MPE is not measured at the maximum power level allowed for production units, the results must be scaled to the maximum tune-up tolerance limit according to the power applied to the individual channels tested to determine compliance.

WLAN 5.2G:

EUT Position	Frequency (MHz)	Test Mode	Max. Meas. Power (dBm)	Max. Rated Power (dBm)	1g SAR (W/kg)				
					Scaled Factor	Duty cycle Factor	Meas. SAR	Scaled SAR	Plot
Head Left Cheek	5180	802.11ac20	/	/	/	/	/	/	/
	5200	802.11ac20	16.5	17	1.122	1	0.173	0.19	/
	5240	802.11ac20	/	/	/	/	/	/	/
Head Left Tilt	5180	802.11ac20	/	/	/	/	/	/	/
	5200	802.11ac20	16.5	17	1.122	1	0.168	0.19	/
	5240	802.11ac20	/	/	/	/	/	/	/
Head Right Cheek	5180	802.11ac20	/	/	/	/	/	/	/
	5200	802.11ac20	16.5	17	1.122	1	0.206	0.23	/
	5240	802.11ac20	/	/	/	/	/	/	/
Head Right Tilt	5180	802.11ac20	16.68	17	1.076	1	0.346	0.37	/
	5200	802.11ac20	16.5	17	1.122	1	0.225	0.25	/
	5240	802.11ac20	16.12	17	1.225	1	0.333	**0.41**	**19#**
Body Front (10mm)	5180	802.11ac20	/	/	/	/	/	/	/
	5200	802.11ac20	16.5	17	1.122	1	0.029	0.03	/
	5240	802.11ac20	/	/	/	/	/	/	/
Body Back (10mm)	5180	802.11ac20	/	/	/	/	/	/	/
	5200	802.11ac20	16.5	17	1.122	1	0.117	0.13	/
	5240	802.11ac20	/	/	/	/	/	/	/
Body Left (10mm)	5180	802.11ac20	16.68	17	1.076	1	0.143	0.15	/
	5200	802.11ac20	16.5	17	1.122	1	0.184	0.21	/
	5240	802.11ac20	16.12	17	1.225	1	0.197	**0.24**	**20#**
Body Top (10mm)	5180	802.11ac20	/	/	/	/	/	/	/
	5200	802.11ac20	16.5	17	1.122	1	0.093	0.10	/
	5240	802.11ac20	/	/	/	/	/	/	/

Note:

1. When the 1-g SAR is≤ 0.8W/kg, testing for other channels are optional.
2. When SAR or MPE is not measured at the maximum power level allowed for production units, the results must be scaled to the maximum tune-up tolerance limit according to the power applied to the individual channels tested to determine compliance.
3. For 802.11ac20 mode power is the largest among 802.11a/n/ac, 802.11 ac20 mode as initial test configuration is selected to test.
4. According 2016 Oct. TCB, for SAR testing of 5G WIFI 802.11a signal with non-100% duty cycle, the measured SAR is scaled-up by the duty cycle scaling factor which is equal to “1/(duty cycle)”.

WLAN 5.8G:

EUT Position	Frequency (MHz)	Test Mode	Max. Meas. Power (dBm)	Max. Rated Power (dBm)	1g SAR (W/kg)				
					Scaled Factor	Duty cycle Factor	Meas. SAR	Scaled SAR	Plot
Head Left Cheek	5745	802.11ac20	/	/	/	/	/	/	/
	5785	802.11ac20	17.27	17.5	1.054	1	0.352	0.37	/
	5825	802.11ac20	/	/	/	/	/	/	/
Head Left Tilt	5745	802.11ac20	/	/	/	/	/	/	/
	5785	802.11ac20	17.27	17.5	1.054	1	0.378	0.40	/
	5825	802.11ac20	/	/	/	/	/	/	/
Head Right Cheek	5745	802.11ac20	17.32	17.5	1.042	1	0.516	0.54	/
	5785	802.11ac20	17.27	17.5	1.054	1	0.536	0.56	/
	5825	802.11ac20	15.83	16	1.04	1	0.558	**0.58**	**21#**
Head Right Tilt	5745	802.11ac20	/	/	/	/	/	/	/
	5785	802.11ac20	17.27	17.5	1.054	1	0.292	0.31	/
	5825	802.11ac20	/	/	/	/	/	/	/
Body Front (10mm)	5745	802.11ac20	/	/	/	/	/	/	/
	5785	802.11ac20	17.27	17.5	1.054	1	0.144	0.15	/
	5825	802.11ac20	/	/	/	/	/	/	/
Body Back (10mm)	5745	802.11ac20	/	/	/	/	/	/	/
	5785	802.11ac20	17.27	17.5	1.054	1	0.400	0.42	/
	5825	802.11ac20	/	/	/	/	/	/	/
Body Left (10mm)	5745	802.11ac20	17.32	17.5	1.042	1	0.397	0.41	/
	5785	802.11ac20	17.27	17.5	1.054	1	0.450	0.47	/
	5825	802.11ac20	15.83	16	1.04	1	0.460	**0.48**	**22#**
Body Top (10mm)	5745	802.11ac20	/	/	/	/	/	/	/
	5785	802.11ac20	17.27	17.5	1.054	1	0.231	0.24	/
	5825	802.11ac20	/	/	/	/	/	/	/

Note:

1. When the 1-g SAR is≤ 0.8W/kg, testing for other channels are optional.
2. When SAR or MPE is not measured at the maximum power level allowed for production units, the results must be scaled to the maximum tune-up tolerance limit according to the power applied to the individual channels tested to determine compliance.
3. For 802.11ac20 mode power is the largest among 802.11a/n/ac, 802.11 ac20 mode as initial test configuration is selected to test.
4. According 2016 Oct. TCB, for SAR testing of 5G WIFI 802.11a signal with non-100% duty cycle, the measured SAR is scaled-up by the duty cycle scaling factor which is equal to “1/(duty cycle)”.

10. MEASUREMENT VARIABILITY

In accordance with published RF Exposure KDB procedure 865664 D01 SAR measurement 100 MHz to 6 GHz v01. These additional measurements are repeated after the completion of all measurements requiring the same head or body tissue-equivalent medium in a frequency band. The test device should be returned to ambient conditions (normal room temperature) with the battery fully charged before it is re-mounted on the device holder for the repeated measurement(s) to minimize any unexpected variations in the repeated results

1) Repeated measurement is not required when the original highest measured SAR is < 0.80 W/kg; steps 2) through 4) do not apply.
2) When the original highest measured SAR is ≥ 0.80 W/kg, repeat that measurement once.
3) Perform a second repeated measurement only if the ratio of largest to smallest SAR for the original and first repeated measurements is > 1.20 or when the original or repeated measurement is ≥ 1.45 W/kg (~ 10% from the 1-g SAR limit).
4) Perform a third repeated measurement only if the original, first or second repeated measurement is ≥1.5 W/kg and the ratio of largest to smallest SAR for the original, first and second repeated measurements is > 1.20.

Note: The same procedures should be adapted for measurements according to extremity and occupational exposure limits by applying a factor of 2.5 for extremity exposure and a factor of 5 for occupational exposure to the corresponding SAR thresholds.

The Highest Measured SAR Configuration in Each Frequency Band

Head

SAR probe calibration point	Frequency Band	Freq.(MHz)	EUT Position	Meas. SAR (W/kg)		Largest to Smallest SAR Ratio
				Original	Repeated	
/	/	/	/	/	/	/

Body

SAR probe calibration point	Frequency Band	Freq.(MHz)	EUT Position	Meas. SAR (W/kg)		Largest to Smallest SAR Ratio
				Original	Repeated	
1750MHz	LTE Band 4	1745	Body Right	0.942	0.925	1.02
1900MHz	LTE Band 2	1860	Body Bottom	0.910	0.891	1.02
2600MHz	LTE Band 7	2560	Body Bottom	0.950	0.937	1.01

Note:

1. Second Repeated Measurement is not required since the ratio of the largest to smallest SAR for the original and first repeated measurement is not > 1.20.
2. The measured SAR results **do not** have to be scaled to the maximum tune-up tolerance to determine if repeated measurements are required.
3. SAR measurement variability must be assessed for each frequency band, which is determined by the **SAR probe calibration point and tissue-equivalent medium** used for the device measurements.

11. DUT HOLDER PERTURBATIONS

In accordance with TCB workshop October 2016:

1) SAR perturbation due to test device holders, depending on antenna locations, buttons locations on phones or device, form factor (e.g. dongles etc.), the measured SAR could be influenced by the relative positions of the test device and its holder
2) SAR measurement standards have included protocols to evaluate this with a flat phantom, with and without the device holder
3) When the highest reported SAR of an antenna is > 1.2 W/kg, holder perturbation verification is required for each antenna, using the highest SAR configuration among all applicable frequency bands in the same exact device and holder positions used for head and body SAR measurements; i.e. same device/button locations in the holder

Per IEEE 1528: 2013/Annex E/E.4.1.1: Device holder perturbation tolerance for a specific test device: Type B

When it is unknown if a device holder perturbs the fields of a test device, the SAR uncertainty shall be assessed with a flat phantom (see Clause 5) by comparing the SAR with and without the device holder according to the following tests:

The SAR tolerance for device holder disturbance is computed using Equation (E.21) and entered in the corresponding row of the appropriate uncertainty table with an assumed rectangular probability distribution and *vi* = ∞ degrees of freedom:

$$SAR_{\text{tolerance}}[\%] = 100 \times \left(\frac{SAR_{\text{w/ holder}} - SAR_{\text{w/o holder}}}{SAR_{\text{w/o holder}}} \right) \quad \text{(E.21)}$$

The Highest Measured SAR Configuration among all applicable Frequency Band

Frequency Band	Freq.(MHz)	EUT Position	Meas. SAR (W/kg)		The Device holder perturbation uncertainty
			With holder	Without holder	
/	/	/	/	/	/

12. SAR SIMULTANEOUS TRANSMISSION DESCRIPTION

12.1 Simultaneous Transmission:

Description of Simultaneous Transmit Capabilities		
Transmitter Combination	**Simultaneous?**	**Hotspot?**
WWAN(GSM/WCDMA/LTE)Antenna + WLAN 2.4G/5G + NFC	√	√
WWAN(GSM/WCDMA/LTE) Antenna + Bluetooth + NFC	√	×
2.4G WLAN + BT	×	×
2.4G WLAN + 5G WLAN	×	×
5G WLAN + BT	×	×

12.2 Simultaneous SAR test exclusion considerations:

Mode(SAR1+SAR2)	Position	Reported SAR(W/kg)		ΣSAR < 1.6W/kg
		SAR1	SAR2	
MAX.WWAN(GSM/WCDMA/LTE)+Bluetooth	Head	0.32	0.07	0.39
	Body	1.05	0.04	1.09
MAX.WWAN(GSM/WCDMA/LTE)+ WLAN 2.4G	Head	0.32	0.23	0.55
MAX.WWAN(GSM/WCDMA/LTE)+ WLAN 2.4G(Hotspot)	Body	1.05	0.14	1.19
MAX.WWAN(GSM/WCDMA/LTE)+ WLAN 5G	Head	0.32	0.58	**0.90**
MAX.WWAN(GSM/WCDMA/LTE)+ WLAN 5G(Hotspot)	Body	1.05	0.48	**1.53**

Note:
1.For the EIRP of NFC is 0.007mW, per KDB447498 D01 clause 4.3, the estimated SAR is so lower, so the NFC almost have no influence on the results of simultaneous transmission.

Conclusion:
Sum of SAR:**ΣSAR ≤1.6 W/kg** therefore simultaneous transmission SAR with Volume Scans is **not required**.

APPENDIX A - MEASUREMENT UNCERTAINTY

The uncertainty budget has been determined for the measurement system and is given in the following Table.

Measurement uncertainty evaluation for IEEE1528-2013 SAR test

Uncertainty component	Tolerance/ uncertainty ± %	Probability distribution	Divisor	ci (1 g)	ci (10 g)	Standard uncertainty ± %, (1 g)	Standard uncertainty ± %, (10 g)
Measurement system							
Probe calibration(k=1)	6.55	N	1	1	1	6.6	6.6
Axial isotropy	4.7	R	√3	√0.5	√0.5	1.9	1.9
Hemispherical isotropy	9.6	R	√3	√0.5	√0.5	3.9	3.9
Boundary effect	1.0	R	√3	1	1	0.6	0.6
Linearity	4.7	R	√3	1	1	2.7	2.7
System detection limits	1.0	R	√3	1	1	0.6	0.6
Modulation response	0.0	R	√3	1	1	0.0	0.0
Readout electronics	0.3	N	1	1	1	0.3	0.3
Response time	0.0	R	√3	1	1	0.0	0.0
Integration time	0.0	R	√3	1	1	0.0	0.0
RF ambient conditions-noise	1.0	R	√3	1	1	0.6	0.6
RF ambient conditions-reflections	1.0	R	√3	1	1	0.6	0.6
Probe positioner mech. tolerance	0.8	R	√3	1	1	0.5	0.5
Probe positioning with respect to phantom shell	6.7	R	√3	1	1	3.9	3.9
Extrapolation, interpolation, and integrations algorithms for max. SAR evaluation	2.0	R	√3	1	1	1.2	1.2
Test sample related							
Test sample positioning	3.3	N	1	1	1	3.3	3.3
Device holder uncertainty	4.7	N	1	1	1	4.7	4.7
Output power variation – SAR draft measurement	5.0	R	√3	1	1	2.9	2.9
SAR scaling	2.8	R	√3	1	1	1.6	1.6
Phantom and tissue parameters							
Phantom shell uncertainty – shape, thickness and permittivity	4.0	R	√3	1	1	2.3	2.3
Uncertainty in SAR correction for deviations in permittivity and conductivity	1.9	N	1	1	0.84	1.9	1.6
Liquid conductivity meas.	2.5	N	1	0.78	0.71	2.0	1.8
Liquid permittivity meas.	2.5	N	1	0.23	0.26	0.6	0.7
Liquid conductivity – temperature uncertainty	1.7	R	√3	0.78	0.71	0.8	0.7
Liquid permittivity – temperature uncertainty	0.3	R	√3	0.23	0.26	0.0	0.0
Combined standard uncertainty		RSS				12.1	12.0
Expanded uncertainty (95 % confidence interval)		k=2				24.2	24.0

Measurement uncertainty evaluation for IEC62209-2 SAR test

Source of uncertainty	Tolerance/ Uncertainty value ± %	Probability Distribution	Divisor	ci (1 g)	ci (10 g)	Standard uncertainty ± %, (1 g)	Standard uncertainty ± %, (10 g)
Measurement system							
Probe calibration	6.55	N	1	1	1	6.6	6.6
Isotropy	4.7	R	√3	1	1	2.7	2.7
Linearity	4.7	R	√3	1	1	2.7	2.7
Probe modulation response	0.0	R	√3	1	1	0.0	0.0
Detection limits	1.0	R	√3	1	1	0.6	0.6
Boundary effect	1.0	R	√3	1	1	0.6	0.6
Readout electronics	0.3	N	1	1	1	0.3	0.3
Response time	0.0	R	√3	1	1	0.0	0.0
Integration time	0.0	R	√3	1	1	0.0	0.0
RF ambient conditions – noise	1.0	R	√3	1	1	0.6	0.6
RF ambient conditions – reflections	1.0	R	√3	1	1	0.6	0.6
Probe positioner mech. restrictions	0.8	R	√3	1	1	0.5	0.5
Probe positioning with respect to phantom shell	6.7	R	√3	1	1	3.9	3.9
Post-processing	2.0	R	√3	1	1	1.2	1.2
Test sample related							
Device holder uncertainty	4.7	N	1	1	1	4.7	4.7
Test sample positioning	3.3	N	1	1	1	3.3	3.3
Power scaling	4.5	R	√3	1	1	2.6	2.6
Drift of output power (measured SAR drift)	5.0	R	√3	1	1	2.9	2.9
Phantom and set-up							
Phantom uncertainty (shape and thickness tolerances)	4.0	R	√3	1	1	2.3	2.3
Algorithm for correcting SAR for deviations in permittivity and conductivity	1.9	N	1	1	0.84	1.9	1.6
Liquid conductivity (meas.)	2.5	N	1	0.78	0.71	2.0	1.8
Liquid permittivity (meas.)	2.5	N	1	0.23	0.26	0.6	0.7
Liquid conductivity – temperature uncertainty	1.7	R	√3	0.78	0.71	0.8	0.7
Liquid permittivity – temperature uncertainty	0.3	R	√3	0.23	0.26	0.0	0.0
Combined standard uncertainty		RSS				11.8	11.7
Expanded uncertainty (95 % confidence interval)						23.6	23.4

APPENDIX B - SAR PLOTS

Please refer to the attachment.

APPENDIX C - EUT TEST POSITION PHOTOS

Please refer to the attachment.

APPENDIX D - PROBE CALIBRATION CERTIFICATES

Please refer to the attachment.

APPENDIX E - DIPOLE CALIBRATION CERTIFICATES

Please refer to the attachment.

===== END OF REPORT ====